FINANCING SOURCES OF INVESTMENT PROJECTS AND REGIONAL ECONOMIC OUTPUT: ECONOMETRIC EVIDENCE FROM SAMARKAND REGION, UZBEKISTAN

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Abstract. *This paper examines how the main financing sources of investment projects relate to regional economic output in Samarkand region, Uzbekistan. Using official annual data for 2010–2025 (n=16), a log-log model links gross regional product (GRP) to fixed-capital investment financed by foreign investment and loans (FIL) and by households' own funds (HF). The baseline model explains 97.0% of the variation in GRP; the estimated elasticities are 0.28 for FIL and 0.69 for HF, both significant at 1%. When a common time trend is added, the FIL coefficient becomes insignificant, while the HF coefficient remains positive and significant (0.14). The results suggest that the sharp post-2019 inflow of foreign capital has so far moved together with the regional growth trend rather than lifting output above it, whereas domestic private funds remain significantly associated with output in levels; neither source is significant in a year-on-year growth specification. Combined with a rising concentration of financing (Herfindahl–Hirschman index of 0.521 in January–September 2025, with foreign sources at 69.5% and bank loans at 2.8%), the findings support diversifying the financing mix of regional investment projects toward bank credit and domestic private capital.*

Keywords: *investment projects; project financing; foreign direct investment; regional growth; elasticity; diversification; Uzbekistan.*

INTRODUCTION

Since 2017 Uzbekistan has pursued an open investment policy, and regions compete actively for capital. In Samarkand region, fixed-capital investment roughly doubled from 14,656.4 bn soums in 2020 to 29,652.5 bn soums in 2024, and the share of foreign investment and loans in its financing rose from 26.9% to 58.1%, reaching 69.4% in the first quarter of 2025. Such a rapid shift raises two policy questions: which financing sources are associated with regional output, and does the growing concentration on foreign funds strengthen or weaken the region's investment potential? Growth theory treats capital accumulation as a key growth driver (Harrod, 1939; Domar, 1946; Solow, 1956), while the literature on foreign investment stresses that its effect depends on absorptive capacity and linkages with the host economy (Dunning & Lundan, 2008).[114] The project-finance literature emphasizes matching funding sources to project risk and maturity (Yescombe, 2014; Gatti, 2018). However, region-level evidence for Uzbekistan that separates the roles of foreign and domestic sources

[114] Domar, E. D. (1946). Capital expansion, rate of growth, and employment. Econometrica, 14(2), 137–147.

remains scarce. This paper contributes such evidence for Samarkand region.

Investment is widely recognized as one of the principal drivers of economic growth, structural transformation, and regional development. By expanding productive capacity, introducing modern technologies, improving infrastructure, and creating employment opportunities, investment contributes to increases in gross regional product (GRP) and strengthens the competitiveness of local economies. However, the contribution of investment to regional economic output depends not only on the total volume of capital invested but also on the sources of financing, the allocation of financial resources among economic sectors, and the efficiency with which investment projects are implemented.

The financing structure of investment projects is particularly important for regions with different levels of infrastructure development, industrial specialization, institutional capacity, and access to financial markets. Investment projects may be financed through several channels, including enterprises’ internal funds, commercial bank loans, foreign direct investment (FDI), government budget allocations, and public-private partnerships (PPPs). Each source has specific characteristics in terms of financing costs, availability, repayment obligations, investment risks, and expected economic returns. Consequently, the choice and combination of financing sources can influence both the implementation of individual projects and the overall economic performance of a region.[115]

The relationship between investment and economic growth has been extensively examined in economic theory. The Harrod–Domar model emphasizes the role of capital accumulation in determining economic growth, while Solow’s neoclassical growth model explains how capital formation interacts with labour and technological progress in shaping long-term output. These theoretical approaches provide a foundation for investigating the relationship between investment financing and regional economic performance. Nevertheless, the impact of investment may differ across regions because of variations in economic structure, institutional conditions, infrastructure, and the productivity of invested capital.

Samarkand Region represents an important case for examining these relationships in Uzbekistan. Its economy includes agriculture, manufacturing, construction, tourism, transport, trade, and a broad range of services. The development of these sectors requires substantial financial resources and the effective implementation of investment projects. At the same time, differences in project characteristics and sectoral financing requirements make it important to evaluate whether particular financing sources are associated with stronger regional economic output.[116]

Despite the growing importance of investment in regional development, the relationship between individual financing sources and GRP requires further empirical investigation. An increase in total investment does not necessarily produce an equivalent increase in economic output. The resulting effect may depend on the proportion of investment financed by bank credit, foreign capital, public resources, or

[115] Dunning, J. H., & Lundan, S. M. (2008). Multinational enterprises and the global economy (2nd ed.). Edward Elgar.
[116] Gatti, S. (2018). Project finance in theory and practice (3rd ed.). Academic Press.

enterprises’ own funds, as well as on the time required for projects to become operational. Therefore, analysing aggregate investment indicators alone may not adequately explain the contribution of different financing mechanisms to regional economic growth.

Against this background, the present study examines the relationship between the financing sources of investment projects and regional economic output in Samarkand Region, Uzbekistan. Its principal objective is to assess econometrically how different sources of investment financing are associated with changes in gross regional product. The study focuses on identifying the relative contribution of financing components, evaluating the statistical significance of their relationships with regional output, and determining the implications of the findings for regional investment policy.

The study is guided by the following research questions: (1) How are the main sources of investment financing related to GRP in Samarkand Region? (2) Which financing sources demonstrate the strongest statistical relationship with regional economic output? (3) To what extent does the financing structure help explain changes in regional output over time? By addressing these questions, the research aims to provide an empirical basis for improving investment policy, diversifying financing mechanisms, and strengthening the economic efficiency of regional investment projects.[117]

LITERATURE REVIEW

The relationship between investment, capital accumulation, and economic growth has been a central subject of economic research. Classical and neoclassical growth theories provide the theoretical foundation for analysing how investment contributes to increases in aggregate and regional output. In particular, the Harrod–Domar model emphasizes the importance of capital accumulation and investment in determining the growth rate of an economy. According to this approach, investment contributes to economic expansion by increasing productive capacity, while the effectiveness of this process depends on the capital-output relationship (Harrod, 1939; Domar, 1946). This perspective is relevant to regional economic analysis because differences in investment volumes and capital productivity may explain variations in regional output.[118]

Solow (1956) developed the neoclassical growth model by incorporating capital, labour, and technological progress as the main determinants of economic growth. Unlike the Harrod–Domar framework, the Solow model emphasizes diminishing returns to capital and the importance of technological advancement in sustaining long-term growth. From a regional perspective, this suggests that the contribution of investment financing to economic output depends not only on the amount of capital accumulated but also on the efficiency of its utilization, the availability of skilled labour, and the technological characteristics of investment projects.

Another important strand of the literature focuses on the relationship between

[117] Gujarati, D. N., & Porter, D. C. (2009). Basic econometrics (5th ed.). McGraw-Hill.
[118] Harrod, R. F. (1939). An essay in dynamic theory. The Economic Journal, 49(193), 14–33.

foreign direct investment and economic growth. Borensztein, De Gregorio, and Lee (1998) argue that foreign direct investment can contribute to economic growth through capital accumulation and technology transfer, although its positive effects depend partly on the host country's absorptive capacity, particularly its level of human capital. This finding is important for regions seeking to attract foreign investment because the availability of external capital alone does not guarantee higher economic output. The effectiveness of foreign investment also depends on the region's capacity to integrate new technologies, management practices, and production methods into its economy.[119]

The role of multinational enterprises in international capital allocation is also examined by Dunning and Lundan (2008). Their research highlights the importance of location-specific advantages, institutional conditions, market potential, and resource availability in determining the geographical distribution of foreign investment. These factors are particularly relevant to regional economies, where differences in infrastructure, labour resources, market accessibility, and institutional quality can influence investors' decisions. Accordingly, regional investment policies should consider not only the volume of foreign capital attracted but also its sectoral distribution and potential contribution to local production.

The literature on investment project financing provides further insights into the relationship between financing structure and economic performance. Yescombe (2014) explains that project finance is based on the expected cash flows and risk profile of individual projects, with financing arrangements structured around their economic viability. Similarly, Gatti (2018) emphasizes the importance of financial structuring, risk allocation, debt capacity, and project cash-flow assessment. These approaches indicate that different investment projects may require different financing combinations. For example, infrastructure projects with long implementation periods may require public financing, development finance, or PPP arrangements, whereas commercially oriented projects may rely more heavily on bank loans, equity, and enterprises' internal resources.[120]

The selection of financing sources is also connected with the broader theory of corporate capital structure. Myers (1984), through the pecking order theory, explains that firms tend to prefer internal financing, followed by debt financing and, as a last resort, external equity. Although this theory primarily concerns corporate financial decisions, it offers a useful framework for understanding the financing behaviour of enterprises implementing regional investment projects. The availability of internal funds, the cost of borrowing, and access to external capital may influence both the scale and timing of investment activities.

Econometric research has further expanded the understanding of investment and economic growth by examining the statistical relationships between investment variables and output indicators. Gujarati and Porter (2009) and Wooldridge (2020) provide methodological foundations for regression analysis, hypothesis testing, model specification, and the interpretation of econometric estimates. These methods allow

[119] Hirschman, A. O. (1945). National power and the structure of foreign trade. University of California Press.
[120] Solow, R. M. (1956). A contribution to the theory of economic growth. The Quarterly Journal of Economics, 70(1), 65–94.

researchers to assess whether changes in investment financing variables are statistically associated with changes in economic output while controlling for other relevant factors. For regional studies, such techniques are particularly useful when analysing time-series data or panel datasets covering multiple regions and periods.[121]

Recent research on Uzbekistan has increasingly addressed regional differences in investment activity and the structure of investment financing. Abdurakhmon ugli examines the regional distribution of fixed-capital investment and its financing components, including budget resources, enterprise and household funds, foreign investment, loans, and bank credit. The study emphasizes the importance of financing diversification and the reduction of regional disparities in investment activity.

Official statistical information provides an important empirical foundation for this research. The National Statistics Committee of Uzbekistan publishes regional data on investment in fixed assets by economic activity and financing sources. In particular, the SIAT statistical database provides annual observations for Samarkand Region, covering sectors such as agriculture, manufacturing, mining, and energy. It also identifies the composition of investment financing and provides indicators that can be used to construct econometric variables.

Despite the substantial theoretical and empirical literature, several research issues remain relevant. First, many studies examine the relationship between total investment and economic growth without distinguishing sufficiently between individual financing sources. Second, research on foreign direct investment and regional development often focuses on national-level outcomes or cross-regional comparisons, while the specific relationship between financing components and the economic output of an individual region requires further investigation. Third, the contribution of different financing sources may vary according to regional economic structure and sectoral investment priorities.[122]

The present study addresses these issues by examining the relationship between the principal sources of investment financing and gross regional product in Samarkand Region. In contrast to analyses based exclusively on aggregate investment volumes, the study distinguishes between financing components and evaluates their individual statistical relationships with regional economic output. This approach is intended to provide a more detailed understanding of how the financing structure of investment projects is associated with regional economic performance.

METHODOLOGY

Annual data for 2010–2025 were taken from the SIAT statistical information system of the Statistics Agency of Uzbekistan: GRP at current prices (indicator 1.01.03.0001), fixed-capital investment financed by foreign investment and loans (1.04.01.0025) and fixed-capital investment financed by households' funds. These two sources are the only ones with consistent long series at the regional level. Two

[121] Statistics Agency under the President of the Republic of Uzbekistan. (2025). Investments in fixed assets, January–September 2025. https://stat.uz
[122] Statistics Agency under the President of the Republic of Uzbekistan. (2026). SIAT statistical information system. https://siat.stat.uz

specifications were estimated by ordinary least squares:[123]

$$\ln GRP_t = \beta_0 + \beta_1 \ln FIL_t + \beta_2 \ln HF_t + \varepsilon_t \quad (1)$$

$$\ln GRP_t = \beta_0 + \beta_1 \ln FIL_t + \beta_2 \ln HF_t + \beta_3 t + \varepsilon_t \quad (2)$$

Model (2) adds a linear trend to separate the common growth path from source-specific effects. Diagnostics include R^2, the F-test, the Durbin–Watson statistic, variance inflation factors (VIF) and the Jarque–Bera normality test (Gujarati & Porter, 2009; Wooldridge, 2020). The concentration of financing is measured by $HHI = \sum s_k^2$, where s_k is the share of source k in total fixed-capital investment.

The present study employs a quantitative research approach to examine the relationship between investment financing sources and regional economic output in Samarkand Region, Uzbekistan. The methodological framework is based on economic-statistical analysis and econometric modelling, which make it possible to evaluate how changes in the composition of investment financing are associated with changes in gross regional product (GRP). The analysis focuses on the financing structure of investment projects rather than considering total investment as a single explanatory factor.

The empirical framework is designed around annual regional data. The recommended observation period is 2010–2025, subject to the availability and comparability of official statistical indicators. Data should be obtained from the Statistics Agency under the President of the Republic of Uzbekistan, particularly its SIAT statistical information system and publications on investment in fixed assets and regional economic development. The main indicators include GRP, investment in fixed assets by source of financing, and other macroeconomic variables that may influence regional output. To ensure consistency, all monetary indicators should be expressed in comparable prices. Where nominal values are used, they should be adjusted for inflation using an appropriate deflator.

The dependent variable of the study is gross regional product, which represents the overall economic output of Samarkand Region. The principal explanatory variables are the main sources of investment financing, including enterprises' own funds, bank loans and other borrowed funds, foreign investment and loans, and budgetary resources. The precise classification should follow the categories reported in the official statistical database for the selected period. If the statistical classification changes over time, the corresponding categories should be harmonized to ensure comparability.[124]

RESULTS AND DISCUSSION

The relationship between investment financing sources and regional economic output represents an important dimension of regional economic development. In Samarkand Region, investment activity is associated with the expansion of productive capacity, infrastructure development, modernization of industrial enterprises, and the growth of tourism and service activities. However, the contribution of investment to gross regional product (GRP) depends not only on the total volume of financial

[123] Wooldridge, J. M. (2020). Introductory econometrics: A modern approach (7th ed.). Cengage.
[124] Yescombe, E. R. (2014). Principles of project finance (2nd ed.). Academic Press.

resources but also on the structure of financing, the sectoral allocation of capital, and the efficiency of project implementation.[125]

The analysis of investment financing requires distinguishing between the principal sources of financial resources used to implement regional investment projects. These include centralized budgetary resources, enterprises' own funds, bank loans, foreign investment and loans, and other non-centralized sources. Each financing category has a different economic function and may contribute to regional output through different mechanisms.

Budgetary financing primarily supports infrastructure, social facilities, transport networks, and other projects that generate long-term regional benefits. Although the economic returns of such investments may not always be reflected immediately in enterprise profitability, improvements in infrastructure can reduce production costs, increase market accessibility, and encourage private investment.

Bank loans provide enterprises with additional financial resources for expanding production, purchasing equipment, introducing technologies, and increasing working capital. Their contribution to regional output depends on credit availability, interest rates, repayment conditions, and the profitability of financed projects. When borrowed resources are allocated to productive activities, they may strengthen industrial capacity and increase regional production. Conversely, high borrowing costs or inefficient investment decisions may reduce the expected economic benefits.

Enterprises' own funds represent an important source of investment because they allow businesses to finance development without creating additional debt obligations. This source may indicate the financial capacity and investment potential of regional enterprises. However, dependence exclusively on internal resources can restrict investment expansion, particularly among small and medium-sized enterprises with limited retained earnings.[126]

Foreign investment and loans can contribute to regional economic development by providing additional capital, modern technologies, international management practices, and access to external markets. Their potential impact is particularly relevant for manufacturing, tourism, logistics, and export-oriented industries. Nevertheless, the actual contribution of foreign investment depends on its sectoral distribution, the degree of integration with local enterprises, and the extent to which investment projects generate value added within the region. Table 1 reports the estimates.

Table 1.

Estimation results, Samarkand region, 2010–2025 (n=16)

Variable	Model (1)	p-value	Model (2)	p-value
Constant	3.599	0.001	7.891	0.000
ln FIL	0.276	0.000	–0.009	0.497
ln HF	0.691	0.000	0.137	0.001
Trend t	–	–	0.183	0.000

[125] Borensztein, E., De Gregorio, J., & Lee, J.-W. (1998). How does foreign direct investment affect economic growth? Journal of International Economics, 45(1), 115–135. https://doi.org/10.1016/S0022-1996(97)00033-0

[126] Chan, M. W. L., Hou, K., Li, X., & Mountain, D. C. (2014). Foreign direct investment and its determinants: A regional panel causality analysis. The Quarterly Review of Economics and Finance, 54(4), 579–589. https://doi.org/10.1016/j.qref.2013.07.004

Variable	Model (1)	p-value	Model (2)	p-value
R^2 (adjusted R^2)	0.970 (0.965)	–	0.999 (0.999)	–
F-statistic	210.8	0.000	5818.5	0.000
Durbin–Watson	1.018	–	1.733	–
Max VIF	1.44	–	32.5	–
Jarque–Bera	0.81	0.667	0.90	0.639

In Model (1), a 1% increase in FIL is associated with a 0.28% increase in GRP, and a 1% increase in HF with a 0.69% increase; multicollinearity is low and residuals are normal. The Durbin–Watson value of 1.018, however, points to possible positive autocorrelation, typical of trending series. Once the common trend is controlled for in Model (2), autocorrelation largely disappears (DW=1.733), the FIL coefficient loses significance, and the HF coefficient remains positive and significant. Because FIL and the trend are strongly collinear (VIF up to 32.5), Model (2) is interpreted as a robustness check rather than as a source of elasticities. A first-difference model (n=15) finds no significant coefficient (HF: 0.095, p=0.113; R^2=0.231, F-test p=0.206), so the associations hold for long-run levels rather than for annual fluctuations. Note also that FIL jumps 8.6-fold between 2018 and 2019, which may partly reflect changes in statistical recording; the trend model helps to control for this break.[127]

The structure of financing reinforces this interpretation. In January–September 2025, of 28,284.3 bn soums invested in Samarkand region, 69.5% came from foreign investment and loans, 18.2% from enterprises, 4.7% from households, 4.2% from the national budget and only 2.8% from commercial bank loans; the seven-source HHI reached 0.521 (0.552 on the three-group basis used for earlier years, up from 0.413 in 2021). Meanwhile, 60.4% of investment was absorbed by small businesses — the segment for which bank credit, leasing and guarantees are the natural instruments.

The evidence indicates that foreign capital has so far scaled up the volume of regional investment along the existing growth path, while domestic private funds are associated with output in levels. Three implications follow. First, regional investment policy should shift from maximizing the volume of foreign inflows to improving their efficiency and local linkages. Second, the financing mix of investment projects should be matched to project size, maturity, risk and expected returns; a target structure with 55% foreign sources, 22% enterprise funds, 10% bank loans, 6% household funds, 5% budget and 2% other sources would lower the HHI from 0.521 to 0.367. Third, raising the bank-credit share requires guarantee and leasing schemes for small and medium-sized projects.[128]

DISCUSSION

The findings of this study provide important insights into the relationship between investment financing sources and regional economic output in Samarkand Region. The econometric results indicate that the composition of investment financing

[127] Chen, Y., Gao, Y., Ge, Y., & Li, J. (2015). Regional financial development and foreign direct investment. Urban Studies, 52(2), 358–373. https://doi.org/10.1177/0042098014528546
[128] Ledyaeva, S., & Linden, M. (2006). Foreign direct investment and economic growth: Empirical evidence from Russian regions (BOFIT Discussion Papers No. 17/2006). Bank of Finland, Institute for Economies in Transition.

is associated with regional economic performance, although the strength and statistical significance of these relationships depend on model specification. In particular, the results highlight differences between foreign investment and loans and households’ own funds, suggesting that the relationship between financing sources and gross regional product (GRP) cannot be adequately explained by investment volumes alone.

The baseline regression model demonstrates statistically significant positive associations between both financing sources and GRP. The estimated elasticity of foreign investment and loans (FIL) is 0.276, indicating that a 1% increase in this financing component is associated with an approximately 0.28% increase in regional output. The corresponding elasticity of households’ funds (HF) is 0.691, suggesting a stronger relationship with GRP in the baseline specification. The model explains approximately 97% of the observed variation in regional output. However, this high explanatory power should be interpreted cautiously because the variables are measured in current prices and exhibit pronounced upward trends over the observation period.

The inclusion of a linear time trend substantially changes the interpretation of the results. While the coefficient of foreign investment and loans becomes statistically insignificant ($\beta = -0.009$; $p = 0.497$), households’ funds retain a positive and statistically significant association with regional output ($\beta = 0.137$; $p = 0.001$). This suggests that the positive relationship between foreign financing and GRP observed in the baseline model is largely associated with their common upward movement over time. By contrast, households’ funds demonstrate a more persistent statistical relationship with regional output after accounting for the common trend. Nevertheless, the high variance inflation factor in the trend-adjusted model (VIF = 32.5) indicates substantial multicollinearity, which limits the precision of the estimated coefficients and requires caution in interpreting their relative importance.

These findings can be considered in relation to established theories of investment and economic growth. The Harrod–Domar framework emphasizes the importance of capital accumulation for economic expansion, whereas Solow (1956) demonstrates that sustained economic growth also depends on productivity and technological progress. The results of the present study are consistent with the broader proposition that increasing investment financing does not necessarily generate proportionate improvements in regional output. Similarly, Borensztein et al. (1998) emphasize that the economic benefits of foreign investment depend on the host economy’s absorptive capacity. In the context of Samarkand Region, this suggests that the effectiveness of foreign financing may depend on its integration with local enterprises, technology transfer, employment creation and domestic value-added generation. These mechanisms are theoretically relevant but cannot be directly verified using the aggregate variables included in the present regression models.

An additional consideration concerns the differences between relationships observed in levels and those identified through annual changes. The first-difference specification does not reveal statistically significant relationships between the financing variables and year-on-year changes in regional output. For households’ funds, the estimated coefficient is 0.095 ($p = 0.113$), while the overall model is statistically insignificant (F-test $p = 0.206$). Consequently, the evidence supports

associations between financing sources and regional output in levels rather than establishing their effects on short-term economic growth. Moreover, without formal stationarity and cointegration testing, the observed level relationships cannot be conclusively interpreted as stable long-run equilibrium relationships.

The analysis of financing concentration provides an additional perspective on the sustainability of regional investment activity. During January–September 2025, foreign investment and loans accounted for 69.5% of total fixed-capital investment in Samarkand Region, whereas commercial bank loans represented only 2.8%. The Herfindahl–Hirschman index reached 0.521, indicating a relatively concentrated financing structure. Such dependence on a dominant financing category may increase exposure to changes in international financial conditions, exchange rates and external capital availability. At the same time, the relatively limited participation of commercial banks suggests opportunities to strengthen domestic financial intermediation, particularly for small and medium-sized investment projects.

The proposed diversification scenario illustrates how changes in the financing structure could reduce concentration. Decreasing the share of foreign investment and loans to 55%, while increasing enterprises’ own funds to 22% and commercial bank loans to 10%, would reduce the calculated HHI to approximately 0.367, representing a decline of 29.5% relative to the observed level. Nevertheless, this result represents a scenario-based structural calculation rather than an empirically demonstrated improvement in economic performance. The effectiveness of such diversification would depend on credit accessibility, financing costs, project profitability and the institutional capacity of regional financial organizations.

From a policy perspective, the findings suggest that regional investment strategies should place greater emphasis on financing quality, project-level efficiency and the interaction between foreign and domestic capital. Foreign investment remains an important potential source of technological modernization, industrial expansion and access to international markets. However, its economic contribution may be strengthened through closer cooperation with local suppliers, greater participation of domestic enterprises and improved integration into regional production networks. Commercial bank lending, leasing and credit guarantee mechanisms could complement these efforts by expanding financing opportunities for smaller investment projects. The observation that small businesses accounted for 60.4% of investment absorption during the first nine months of 2025 further underscores the relevance of developing accessible domestic financing instruments.

Several methodological limitations should be acknowledged. First, the analysis is based on only 16 annual observations for a single region, restricting statistical power and the generalizability of the findings. Second, the use of current-price monetary indicators means that inflation and common nominal growth may influence the estimated relationships. Third, the substantial increase in foreign investment and loans between 2018 and 2019 raises the possibility of a structural break or changes in statistical recording. Fourth, the estimated models do not explicitly control for labour input, technological development, sectoral composition, institutional conditions or other determinants of regional output. Finally, the available financing categories

combine foreign investment and loans, preventing separate identification of their potentially different economic relationships.

Future research should address these limitations by employing inflation-adjusted data, longer time series and district-level or interregional panel datasets. Unit-root and cointegration tests, structural-break analysis, lagged investment specifications and appropriate dynamic econometric models would help establish whether the observed relationships are stable and economically meaningful. Further research should also distinguish foreign direct investment from foreign borrowing and examine how sectoral allocation, investment productivity and domestic supply-chain linkages influence regional economic outcomes.

Overall, the discussion indicates that the relationship between investment financing and regional economic performance is more complex than a direct correspondence between capital inflows and output growth. The results emphasize the importance of distinguishing common economic trends from financing-specific statistical associations, while the concentration analysis highlights opportunities for greater diversification. For Samarkand Region, a more balanced financing structure, combined with project-level evaluation and stronger domestic financial institutions, may provide a foundation for improving the resilience and effectiveness of regional investment policy.

CONCLUSION

Using official data for Samarkand region, the study finds a strong long-run association between financing sources and regional output, but only domestic private funds retain a significant association after controlling for the common trend. Given the short annual sample and current-price data, the coefficients should be read as long-run associations rather than causal effects; future work will use quarterly and district-level panel data. This study examines the relationship between investment project financing sources and regional economic output, using Samarkand Region of Uzbekistan as the research setting. The research is based on the theoretical proposition that investment is an important determinant of regional economic development, while the economic contribution of investment depends on the availability, structure, and efficiency of financing mechanisms.

The theoretical analysis identifies several principal sources of investment financing, including budgetary resources, commercial bank loans, enterprises' own funds, foreign investment and loans, and household resources. Each source performs a different economic function. Budgetary financing supports infrastructure and public investment, bank loans facilitate enterprise expansion, internal funds strengthen business investment capacity, and foreign investment can contribute to capital accumulation and technological modernization.

The proposed econometric framework provides a methodological basis for examining the relationship between these financing sources and gross regional product. The use of regression analysis, descriptive statistics, correlation analysis, and diagnostic testing makes it possible to evaluate the direction, magnitude, and statistical significance of the relationships between financing components and regional economic

output. The inclusion of lagged investment variables may also help account for the time required for investment projects to generate economic returns.

The study highlights the importance of developing a diversified investment financing system in Samarkand Region. Regional authorities and financial institutions should improve the coordination of public and private financing, strengthen access to long-term credit, encourage foreign investment, and support the reinvestment of enterprises' own financial resources. Investment allocation should also be guided by project efficiency, expected value added, employment generation, technological development, and long-term regional benefits.

Furthermore, regional investment policy should move beyond evaluating investment performance exclusively through the volume of attracted capital. Greater attention should be paid to the productivity of investment, the quality of implemented projects, the sustainability of financing arrangements, and their contribution to regional economic diversification.

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