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STRUCTURAL BREAK AND REGIONAL DIVERGENCE IN SMALL AND MEDIUM BUSINESS DEVELOPMENT IN UZBEKISTAN: EVIDENCE FROM CONVERGENCE, CLUSTER AND REGRESSION ANALYSIS

Abstract. The paper examines how the contribution of small and medium business (SME) to the economy of Uzbekistan has evolved at the national and regional levels and whether the regions are moving closer to each other in terms of SME development. The study uses official statistical series for 2010–2025 on the share of SMEs in GDP and in key sectors, regional data on the share of SMEs in gross regional product (GRP) for 14 territories in 2016–2025, and annual business demography coefficients for 2010–2026. A four-stage design is applied: Welch's t-test for a structural shift in business demography, linear trend estimation with Ward hierarchical clustering of regions, σ- and β-convergence tests, and a multiple regression model with a post-2019 dummy variable and a full set of diagnostic tests. The results show that after 2019 the net viability rate of SMEs increased from 4.3% to 14.4% ($p<0.01$), while the share of SMEs in GRP declined significantly in 11 of 14 regions. The coefficient of variation across regions rose from 12.8% to 22.1%, and no statistically significant β-convergence was found. The regression model ($R^2=0.885$) shows that the industrial participation of SMEs raises their share in GDP, whereas the expansion of their share in exports does not. The findings justify a regionally differentiated SME support policy based on the typology of territories.

Keywords. small and medium business, regional divergence, σ-convergence, β-convergence, Ward clustering, structural break, Chow test, business demography, Uzbekistan.

1. Introduction

Over the past decade Uzbekistan has carried out a series of reforms that changed the conditions for doing business: registration procedures were simplified, the number of inspections was reduced, special tax regimes for small business were introduced and a dedicated state bank for business development was created. These measures were expected to raise both the number of active business entities and their role in output, employment and exports. National statistics confirm part of this expectation: in 2025 small and medium business accounted for 74.9% of total employment, 97.1% of agricultural output, 60.9% of fixed capital investment and 36.6% of exports. At the same time, the share of SMEs in GDP fell from its peak of

67.4% in 2017 to 52.2% in 2025. This apparent contradiction between the quantitative growth of the sector and the decline of its share in value added needs a statistical explanation.

The national average hides large differences among territories. In 2025 the share of SMEs in GRP ranged from 21.1% in Navoi region, where large mining and metallurgical enterprises dominate, to 76.4% in Surkhandarya region. For a country with 14 territorial units that differ in resource endowment, industrial structure and access to markets, the key question is not only whether SMEs grow, but whether the regional gaps in their development narrow over time or widen. If gaps narrow by themselves, a uniform support policy is sufficient; if they persist or widen, support instruments must be differentiated by region.

The aim of this study is to assess the structural shift in SME development in Uzbekistan after 2019, to identify regional types by the level and direction of change of the SME share in GRP, to test σ- and β-convergence among regions, and to estimate which sectoral indicators explain the dynamics of the SME share in GDP. The novelty of the paper lies in combining business demography, regional convergence and macro-level regression into one empirical framework on the official data of Uzbekistan for 2010–2025. In contrast to earlier studies by the author, which focused on forecasting SME indicators of Bukhara region [15] and on assessing the economic efficiency of small business [16], this paper is devoted to the territorial dimension of SME development at the national level.

2. Literature review

The contribution of SMEs to economic growth has been widely discussed in the empirical literature. Beck, Demirgüç-Kunt and Levine, using cross-country data, found that a large SME sector is associated with faster growth, but argued that the causal link depends on the general business environment rather than on the size of firms as such [1]. Ayyagari, Beck and Demirgüç-Kunt showed that the share of SMEs in employment and output varies greatly across countries and is systematically related to the quality of institutions and the cost of entry [2]. Haltiwanger, Jarmin and Miranda demonstrated that firm age, rather than firm size, explains most of the net job creation, which highlights the importance of business demography – the rates of creation and exit of firms – for understanding the dynamics of the sector [3]. These studies provide the basis for analysing creation, liquidation and net viability rates as separate indicators of SME development.

The regional dimension of entrepreneurship has been examined by Audretsch and Keilbach, who introduced the concept of entrepreneurship capital and showed that regions with higher start-up activity achieve higher productivity [4]. Fritsch and Mueller found that the effect of new business formation on regional development unfolds over several years and differs between regions with different initial

conditions [5]. In the theory of economic geography, Krugman explained that increasing returns and agglomeration effects may cause economic activity to concentrate in some territories, so that regional disparities do not necessarily disappear [6]. Williamson earlier proposed that regional inequality first increases and then decreases in the course of national development [7].

The methodological basis for testing whether regional gaps narrow was developed in the convergence literature. Barro and Sala-i-Martin formalised β-convergence as a negative relation between the initial level of an indicator and its subsequent growth, and σ-convergence as a decline of cross-sectional dispersion over time [8]. Sala-i-Martin emphasised that β-convergence is a necessary but not sufficient condition for σ-convergence, so both tests should be applied together [9]. Quah criticised the regression approach and showed that regions may form separate groups ("convergence clubs") instead of moving to a single level [10], which justifies the use of cluster analysis alongside convergence tests. For the identification of homogeneous groups, the hierarchical method proposed by Ward, which minimises the within-group sum of squares, remains one of the most widely used procedures [11].

For time-series regression with a possible change in the economic regime, Chow proposed an F-test that checks whether the parameters of a model are the same before and after a given date [12]. Welch developed a modification of the t-test for comparing two means when variances are unequal [13], which is suitable for comparing short periods with different volatility. In the national literature, the statistical study of small business in Uzbekistan has mostly concentrated on the dynamics and forecasting of individual indicators and on the efficiency of the sector [15; 16], while the territorial convergence of the SME sector has not been studied systematically. This gap determined the focus of the present paper.

3. Methods

The study is based on official data of the National Statistics Committee of the Republic of Uzbekistan [14]. Three data sets were used: (a) annual national shares of SMEs in GDP, industry, agriculture, construction, employment, exports, imports and investment for 2010–2025 (16 observations); (b) the share of SMEs in GRP for 14 territories (the Republic of Karakalpakstan, 12 regions and Tashkent city) for 2016–2025 (140 observations); (c) annual coefficients of creation, liquidation and net viability of SME entities for 2010–2026 (17 observations). Since the official statistics publish output, exports and employment for the category of small business, these series are used as indicators of the SME sector.

The analysis was carried out in four stages. At the first stage, the presence of a structural shift in business demography was tested by comparing the means of the 2010–2018 and 2019–2026 periods with Welch's t-test:

$$t = (\bar{x}_1 - \bar{x}_2) / \sqrt{(s_1^2/n_1 + s_2^2/n_2)}, \quad (1)$$

where $\bar{x}_1$, $\bar{x}_2$ are period means, s_1^2, s_2^2 are variances and n_1, n_2 are the numbers of years in each period.

At the second stage, a linear trend $Y_{it} = a_i + b_i t + \varepsilon_{it}$ was estimated for each region i, where b_i is the average annual change of the SME share in GRP in percentage points (p.p.). The regions were then grouped by Ward's method using two standardised features: the level of the SME share in 2025 and the trend coefficient b_i.

At the third stage, σ-convergence was assessed by the dynamics of the coefficient of variation across regions:

$$V_t = \sigma_t / \bar{Y}_t \times 100\%, \quad (2)$$

and β-convergence by the cross-sectional regression of the average annual change on the initial level:

$$(Y_{i,2025} - Y_{i,2016}) / 9 = \alpha + \beta \cdot Y_{i,2016} + u_i, \quad (3)$$

where a negative and significant β indicates that regions with a lower initial share grow faster. Both tests were repeated without Navoi region, which is an outlier because of its specific industrial structure.

At the fourth stage, Pearson pair correlation coefficients between the SME share in GDP and the sectoral indicators were calculated, and the following multiple regression model was estimated by the ordinary least squares method:

$$GDP_t = \beta_0 + \beta_1 IND_t + \beta_2 INV_t + \beta_3 EXP_t + \beta_4 D_t + \varepsilon_t, \quad (4)$$

where GDP is the SME share in GDP, %; IND – the SME share in industrial output, %; INV – the SME share in fixed capital investment, %; EXP – the SME share in exports, %; D is a dummy variable equal to 1 for 2019–2025 and 0 otherwise. The SME share in employment was not included in the model because it is formed simultaneously with the dependent variable. The adequacy of the model was checked by the Breusch–Pagan test for heteroskedasticity, the Breusch–Godfrey LM test and the Durbin–Watson statistic for autocorrelation, the Jarque–Bera and Shapiro–Wilk tests for normality of residuals, the Ramsey RESET test for specification, the variance inflation factor (VIF) for multicollinearity and the Chow test for a structural break in 2019.

4. Results

The descriptive statistics of the national series (Table 1) show that the indicators of SME participation differ sharply in their level and volatility. The share of SMEs in agriculture remained almost constant at about 98%, and in employment at about 75%, with coefficients of variation of only 1.0% and 2.1%. By contrast, the shares in exports (25.9%), industry (19.1%) and investment (17.2%) were highly volatile. Over 2010–2025 the SME share increased in exports by 22.9 p.p., in investment by 28.5 p.p. and in construction by 21.1 p.p., whereas the share in GDP

decreased by 8.6 p.p. This means that the SME sector has expanded its presence in the real sectors of the economy, but this expansion has not been translated into a higher share of value added.

Table 1. Descriptive statistics of the SME shares in the economy of Uzbekistan, 2010–2025, %

Indicator	Mean	Std. dev.	Min	Max	CV, %	Change 2025/2010, p.p.
GDP	59.59	4.78	52.2	67.4	8.0	−8.6
Industry	32.51	6.20	25.8	45.3	19.1	+8.3
Agriculture	98.24	0.97	96.7	99.4	1.0	−1.7
Construction	70.10	5.96	52.5	78.5	8.5	+21.1
Employment	75.72	1.57	73.9	78.2	2.1	+0.6
Exports	24.95	6.45	13.7	36.6	25.9	+22.9
Imports	47.47	7.40	34.3	61.6	15.6	+17.8
Investment	46.59	8.02	32.4	60.9	17.2	+28.5

Source: calculated by the author based on data of the National Statistics Committee of the Republic of Uzbekistan [14].

The dynamics of business demography (Figure 1) indicate a clear change in 2019. In 2010–2018 the creation rate gradually decreased from 19.0% to 10.2% (2013) and then recovered slowly, while the liquidation rate remained at 9–11%. As a result, the net viability rate stayed in the range of 0.9–8.1%. After 2019 the creation rate rose to 26.2% in 2020, the liquidation rate fell to 2.3% in 2021, and the net viability rate reached its maximum of 21.8% in 2020. In 2026 the net viability rate decreased to 10.3% due to slower creation of new entities.

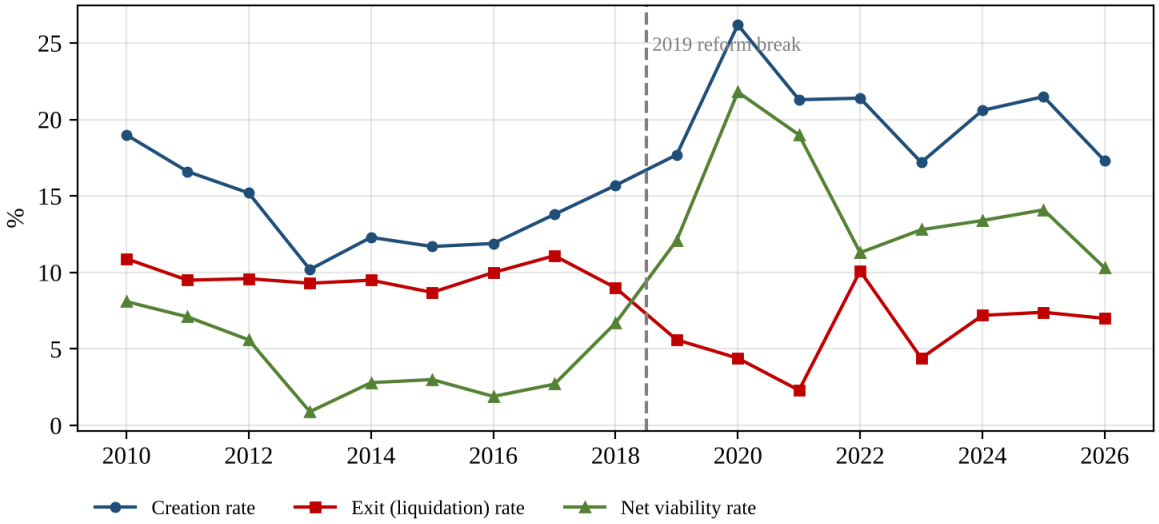


Figure 1. Creation, liquidation and net viability rates of SME entities in Uzbekistan, 2010–2026, %

Source: compiled by the author based on [14].

The Welch test confirms that the shift is statistically significant (Table 2). The mean creation rate increased from 14.04% to 20.40% ($t=-4.48$; $p<0.001$), the mean liquidation rate decreased from 9.73% to 6.05% ($t=4.15$; $p=0.003$), and the net viability rate increased 3.3 times, from 4.31% to 14.35% ($t=-6.08$; $p<0.001$). At the same time, the coefficient of variation of the liquidation rate increased from 8.3% to 39.6%. Thus, after the reforms more businesses were created and fewer were closed on average, but the closure of firms became much less predictable from year to year.

Table 2. Comparison of business demography coefficients before and after 2019 (Welch's t-test)

Coefficient	2010–2018: mean (σ)	2019–2026: mean (σ)	CV, % (before / after)	Welch t	p-value
Creation rate, %	14.04 (2.81)	20.40 (3.02)	20.0 / 14.8	−4.48	<0.001
Liquidation rate, %	9.73 (0.81)	6.05 (2.40)	8.3 / 39.6	4.15	0.003
Net viability rate, %	4.31 (2.59)	14.35 (3.99)	60.0 / 27.8	−6.08	<0.001

Source: calculated by the author based on [14].

Another feature of the recent period is the sharp decrease in the share of active entities among registered SMEs. In 2021–2023 the activity rate was 94–95% in the country as a whole and 87–97% in all territories, but in 2025 it fell to 54.9%, with the lowest values in Andijan (42.2%), Syrdarya (45.2%) and Jizzakh (46.9%) regions and the highest in Tashkent city (62.0%) and Bukhara region (60.5%). In 2026 the number of registered entities decreased from 651.8 thousand to 493.0 thousand and the activity rate returned to 96.3%, which is most likely explained by

the cleaning of the statistical register from inactive entities. Therefore, the 2026 data on the number of entities should be compared with earlier years with caution.

The regional trend analysis (Table 3) shows that the decline of the SME share is a nationwide process rather than a feature of individual regions. The trend coefficient is negative and statistically significant at the 5% level in 11 of 14 territories. The fastest decline was observed in Navoi region (−3.12 p.p. per year; R^2=0.83), Tashkent city (−2.01 p.p.) and Jizzakh region (−1.69 p.p.). In Bukhara region the share decreased from 79.3% in 2016 to 71.0% in 2025, or by 1.14 p.p. per year, with a high goodness of fit (R^2=0.84). Only in the Republic of Karakalpakstan, Kashkadarya and Fergana regions was the trend insignificant, and the SME share remained stable.

Table 3. Trend and typology of the SME share in GRP by region, 2016–2025

Region	2016, %	2025, %	Change, p.p.	Trend b, p.p./year	R^2	p-value	Cluster
Rep. of Karakalpakstan	63.6	65.5	+1.9	0.07	0.01	0.739	I
Andijan	83.6	70.1	−13.5	−1.49	0.76	0.001	II
Bukhara	79.3	71.0	−8.3	−1.14	0.84	<0.001	II
Jizzakh	84.2	71.2	−13.0	−1.69	0.88	<0.001	II
Kashkadarya	66.7	69.2	+2.5	−0.29	0.10	0.378	I
Navoi	50.4	21.1	−29.3	−3.12	0.83	<0.001	III
Namangan	79.8	73.6	−6.2	−1.04	0.81	<0.001	II
Samarkand	81.2	69.5	−11.7	−1.48	0.88	<0.001	II
Surkhandarya	79.1	76.4	−2.7	−0.57	0.59	0.010	II
Syrdarya	75.9	69.5	−6.4	−1.41	0.70	0.003	II
Tashkent region	67.9	55.0	−12.9	−1.53	0.46	0.030	II
Fergana	73.9	73.0	−0.9	−0.14	0.16	0.252	I
Khorezm	79.4	71.6	−7.8	−1.11	0.88	<0.001	II
Tashkent city	68.1	51.7	−16.4	−2.01	0.77	<0.001	II

Note: cluster I – regions with a stable SME share; II – regions with a declining share; III – a region dominated by large industry with a rapidly declining share. Source: calculated by the author based on [14].

Ward clustering on the standardised level and trend features divided the territories into three groups (Figure 2). Cluster I includes the Republic of Karakalpakstan, Kashkadarya and Fergana regions with a stable SME share of 65–73%. Cluster II, the largest group, includes 10 territories in which the share is high or medium but has been declining steadily; within this cluster Tashkent region and Tashkent city form a separate sub-group with the lowest levels (51.7–55.0%). Navoi region forms an independent cluster III because of the lowest level and the fastest decline of the indicator. Bukhara region belongs to cluster II and is located closest to Khorezm region, which indicates similar development paths of SMEs in these two neighbouring regions.

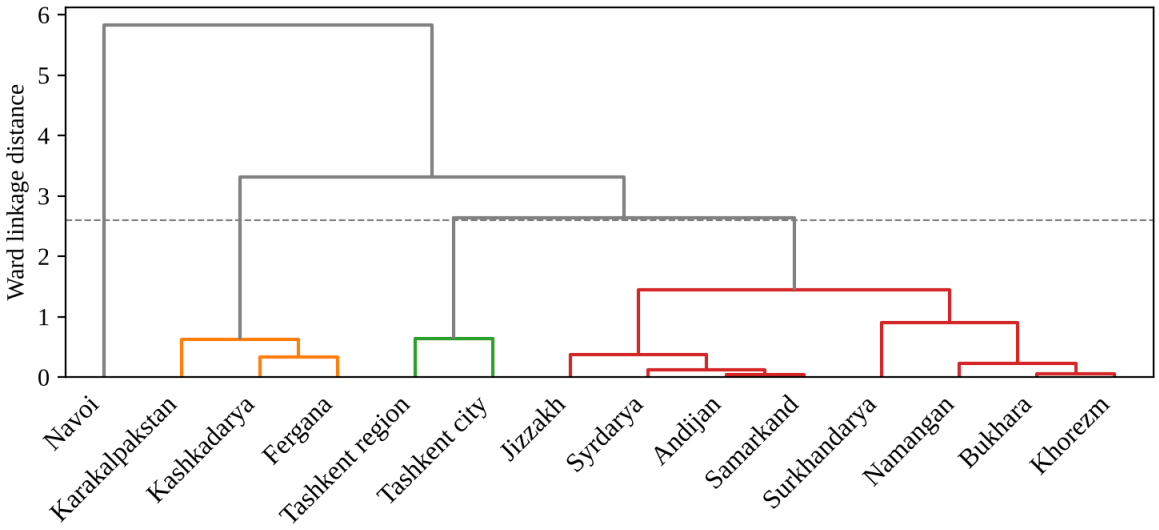


Figure 2. Dendrogram of Ward clustering of regions by the level (2025) and trend (2016–2025) of the SME share in GRP

Source: compiled by the author based on Table 3.

The σ-convergence analysis (Table 4, Figure 3) shows that regional disparities increased. The average SME share across regions decreased from 73.8% in 2016 to 64.9% in 2025, while the standard deviation increased from 9.44 to 14.34 p.p., and the coefficient of variation rose from 12.8% to 22.1%. This indicates σ-divergence. However, the result depends strongly on Navoi region. When it is excluded, the coefficient of variation increased from 9.1% in 2016 to 14.3% in 2021 and then decreased to 10.4% in 2025. Therefore, among the other 13 territories regional gaps widened until 2021 and began to narrow after that.

Table 4. Dynamics of regional disparities in the SME share in GRP (σ-convergence)

Year	Mean, %	Std. dev., p.p.	Range, %	CV, %	CV excluding Navoi, %
2016	73.8	9.44	50.4–84.2	12.8	9.1
2017	75.5	10.80	46.5–86.4	14.3	9.2
2018	73.6	11.73	42.6–86.7	15.9	10.4
2019	69.2	13.58	32.4–84.0	19.6	12.3
2020	68.2	15.40	25.3–83.8	22.6	13.4
2021	67.2	15.08	27.0–80.6	22.4	14.3
2022	65.5	13.96	26.8–78.3	21.3	12.8
2023	65.4	13.15	27.6–76.6	20.1	11.3
2024	66.0	14.22	23.5–77.9	21.5	10.9
2025	64.9	14.34	21.1–76.4	22.1	10.4

Source: calculated by the author based on [14].

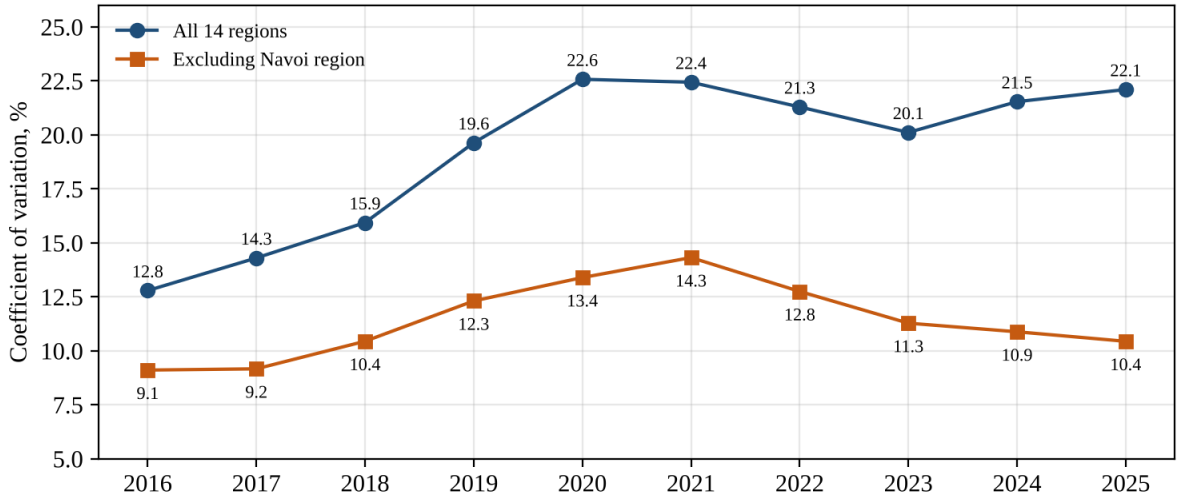


Figure 3. Coefficient of variation of the SME share in GRP across regions, 2016–2025, %

Source: compiled by the author based on Table 4.

The β-convergence test (Table 5, Figure 4) does not confirm that regions with a lower initial share catch up with the others. For all 14 territories the β coefficient is positive (β=0.030; t=1.10; p=0.293; R^2=0.09), that is, the direction of the relationship is even opposite to convergence. Without Navoi region the coefficient becomes negative (β=−0.040), but it is not statistically significant (p=0.170; R^2=0.16). In Figure 4 it can be seen that the regions with the highest initial share (Jizzakh, Andijan, Samarkand) have lost the most, while Karakalpakstan and Kashkadarya with lower initial shares kept their positions; at the same time, Tashkent city and Tashkent region with similar initial levels declined quickly. Consequently, the initial level alone does not explain the regional dynamics, and the regional gaps do not close by themselves.

Table 5. Results of the β-convergence regression of the SME share in GRP, 2016–2025

Sample	α (constant)	β	t (β)	p (β)	R^2	n
All territories	−3.175	0.030	1.10	0.293	0.09	14
Excluding Navoi region	2.210	−0.040	−1.47	0.170	0.16	13

Source: calculated by the author based on [14].

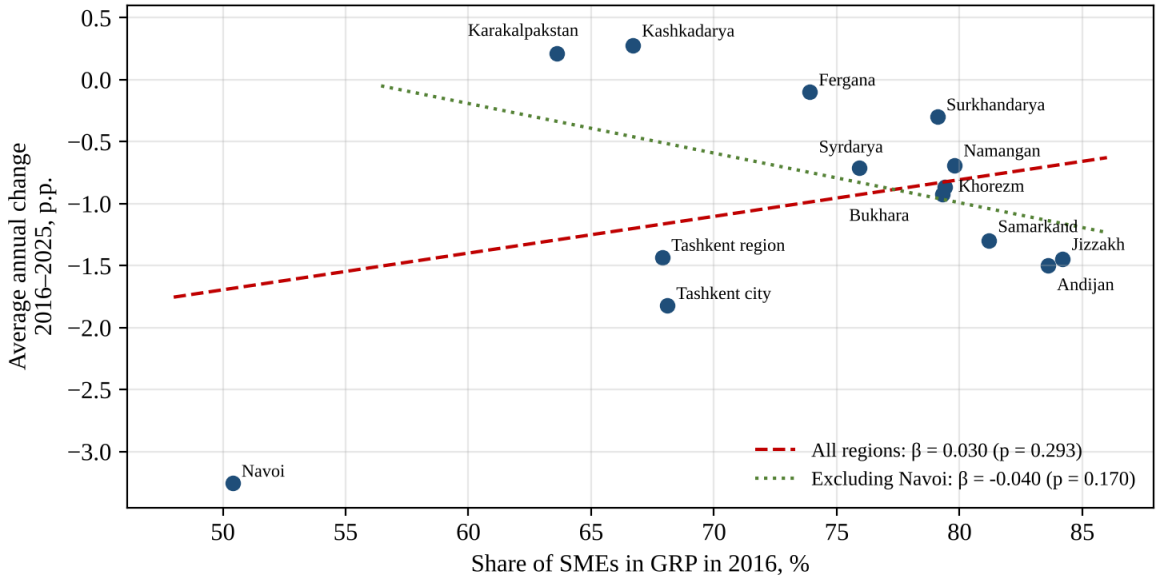


Figure 4. Initial SME share in GRP (2016) and its average annual change (2016–2025) by region

Source: compiled by the author based on [14].

To explain the national dynamics, the correlation between the SME share in GDP and the sectoral indicators was examined (Table 6). The SME share in GDP is strongly and positively related to the share in employment (r=0.84) and moderately to the share in industry (r=0.68). The relationship with agriculture is also strong (r=0.88), but because this indicator varies in a very narrow range (96.7–99.4%), it carries little information for the regression model. Inverse relationships were found with the shares in construction (r=−0.55) and investment (r=−0.56), while correlations with exports and imports are not significant at the 5% level.

Table 6. Pearson correlation coefficients between the SME share in GDP and sectoral indicators, 2010–2025

Indicator (SME share in…)	r	p-value	Strength and direction
Industry	0.68	0.004	moderate, direct
Agriculture	0.88	<0.001	strong, direct
Construction	−0.55	0.028	moderate, inverse
Employment	0.84	<0.001	strong, direct
Exports	−0.43	0.101	not significant
Imports	−0.22	0.408	not significant
Investment	−0.56	0.023	moderate, inverse

Source: calculated by the author based on [14].

The results of model (4) and its diagnostics are presented in Table 7. The model is statistically significant (F=21.18; p<0.001) and explains 88.5% of the variation in the SME share in GDP (adjusted R^2=0.843). The estimated equation is:

$$GDP = 53.452 + 0.381 \cdot IND + 0.067 \cdot INV - 0.292 \cdot EXP - 4.734 \cdot D$$

Table 7. Regression model of the SME share in GDP and diagnostic tests, 2010–2025

Variable / test	Coefficient (statistic)	Std. error	t	p-value
Constant	53.452	4.132	12.94	<0.001
Share in industry (IND)	0.381	0.158	2.40	0.035
Share in investment (INV)	0.067	0.154	0.44	0.672
Share in exports (EXP)	−0.292	0.121	−2.42	0.034
Post-2019 dummy (D)	−4.734	2.810	−1.69	0.120
R^2 / adjusted R^2	0.885 / 0.843		F = 21.18	<0.001
Breusch–Pagan (heteroskedasticity)	χ^2 = 2.95			0.566
Breusch–Godfrey LM(1) (autocorrelation)	χ^2 = 0.34		DW = 1.54	0.558
Jarque–Bera / Shapiro–Wilk (normality)	0.84 / 0.951			0.658 / 0.503
Ramsey RESET (specification)	F = 1.42			0.291
VIF (maximum)	8.67			–
Chow test (break in 2019)	F = 5.07			0.025
Number of observations	16			

Source: calculated by the author based on [14].

The coefficient of the industrial share is positive and significant (β_1=0.381; p=0.035): an increase of the SME share in industrial output by 1 p.p. is associated with an increase of the SME share in GDP by 0.381 p.p. on average, which corresponds to an elasticity of about 0.21 at the sample means. The coefficient of the export share is negative and significant (β_3=−0.292; p=0.034). The investment share is not significant (p=0.672), which can be explained by the time lag between investment and the output it generates. The dummy variable shows that after 2019, other factors being equal, the SME share in GDP was on average 4.7 p.p. lower, although the coefficient is significant only at the 12% level; the Chow test, however, confirms a structural break in 2019 (F=5.07; p=0.025). The diagnostic tests show no heteroskedasticity, first-order autocorrelation or specification error, the residuals are normally distributed and the maximum VIF is below 10. The comparison of actual and fitted values (Figure 5) shows that the model reproduces both the rise of the SME share until 2017 and its decline after 2018; the largest deviations are observed in 2019 and 2025.

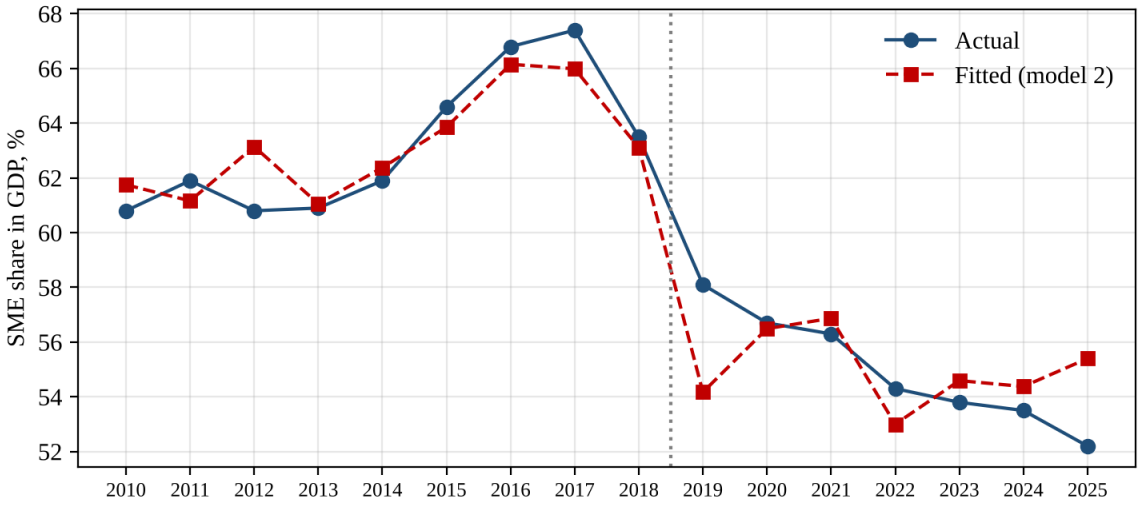


Figure 5. Actual and fitted values of the SME share in GDP, 2010–2025, %

Source: compiled by the author based on Table 7.

5. Discussion

The results show that the reforms after 2019 have had two different effects on the SME sector of Uzbekistan. On the one hand, business demography improved significantly: the net viability rate tripled, which is consistent with the view that lower entry costs and better institutions stimulate firm creation [2; 3]. On the other hand, the share of SMEs in GDP and in the GRP of most regions continued to fall. This does not mean that SMEs were shrinking in absolute terms – over 2020–2025 SME exports increased four times and the number of employed in the sector by 11.2%. Rather, large industrial and investment projects grew faster, and the relative weight of SMEs decreased. The negative coefficient of the post-2019 dummy and the significant Chow test reflect precisely this change in the structure of the economy.

The negative effect of the SME export share on the SME share in GDP deserves special attention. It suggests that the growth of SME exports has been based mainly on goods with a low degree of processing, which increase export volumes but add little value. The positive and significant effect of industrial participation, in contrast, shows that the share of SMEs in value added can be raised mainly by involving them in manufacturing, including through cooperation with large enterprises. This result is in line with the argument of Beck et al. that the growth effect of SMEs depends on the sectors and conditions in which they operate, not on their number [1].

The absence of β-convergence together with σ-divergence supports the “convergence clubs” perspective of Quah [10] rather than the idea of automatic regional equalisation. The territories of Uzbekistan form at least three distinct groups with different trajectories, and Navoi region follows a separate path determined by

its mining and metallurgical specialisation, in line with the agglomeration logic of Krugman [6]. The narrowing of disparities among the other 13 territories after 2021 is a positive sign, but it is not strong enough to be confirmed by the β-test. It should be noted that the regression is based on 16 annual observations and the convergence tests on 14 regions, so the results should be interpreted as estimates of tendencies; nevertheless, the consistency of the conclusions obtained by different methods increases confidence in them.

6. Conclusion

The study leads to the following conclusions. First, a statistically significant structural shift in SME demography occurred after 2019: the creation rate increased, the liquidation rate decreased and the net viability rate increased from 4.3% to 14.4% ($p<0.01$), although the volatility of firm closures increased. Second, the share of SMEs in GRP declined significantly in 11 of 14 territories, and Ward clustering divided the regions into three types: stable (Karakalpakstan, Kashkadarya, Fergana), declining (10 territories, including Bukhara region) and industrially dominated (Navoi). Third, regional disparities widened (the coefficient of variation increased from 12.8% to 22.1%), and no significant β-convergence was found, so the gaps do not close automatically. Fourth, the SME share in GDP is positively influenced by SME participation in industry ($\beta=0.381$) and negatively by the growth of their export share ($\beta=-0.292$), and a structural break in 2019 is confirmed by the Chow test.

Based on these results, the following recommendations are proposed: to differentiate SME support programmes by regional type, giving priority to cluster II regions with a steady decline of the SME share, including Bukhara region; in industrially dominated regions such as Navoi, to develop cooperation and subcontracting links between large enterprises and SMEs; to direct preferential lending and export support towards SMEs that produce goods with a higher degree of processing; to monitor creation, liquidation and activity rates of SMEs by region on a regular basis and to publish them in a comparable form after the cleaning of the statistical register; and to include indicators of regional dispersion (coefficient of variation, β-coefficient) in the system of indicators for evaluating SME policy. Further research may extend the analysis to the district level and to panel models with spatial effects.

References

[1] T. Beck, A. Demirgüç-Kunt and R. Levine, “SMEs, growth, and poverty: Cross-country evidence,” Journal of Economic Growth, vol. 10, no. 3, pp. 199–229, 2005.

[2] M. Ayyagari, T. Beck and A. Demirgüç-Kunt, “Small and medium enterprises across the globe,” Small Business Economics, vol. 29, no. 4, pp. 415–434, 2007.

[3] J. Haltiwanger, R. S. Jarmin and J. Miranda, “Who creates jobs? Small versus large versus young,” The Review of Economics and Statistics, vol. 95, no. 2, pp. 347–361, 2013.

[4] D. B. Audretsch and M. Keilbach, “Entrepreneurship capital and economic performance,” Regional Studies, vol. 38, no. 8, pp. 949–959, 2004.

[5] M. Fritsch and P. Mueller, “Effects of new business formation on regional development over time,” Regional Studies, vol. 38, no. 8, pp. 961–975, 2004.

[6] P. Krugman, “Increasing returns and economic geography,” Journal of Political Economy, vol. 99, no. 3, pp. 483–499, 1991.

[7] J. G. Williamson, “Regional inequality and the process of national development: A description of the patterns,” Economic Development and Cultural Change, vol. 13, no. 4, pp. 1–84, 1965.

[8] R. J. Barro and X. Sala-i-Martin, “Convergence,” Journal of Political Economy, vol. 100, no. 2, pp. 223–251, 1992.

[9] X. Sala-i-Martin, “The classical approach to convergence analysis,” The Economic Journal, vol. 106, no. 437, pp. 1019–1036, 1996.

[10] D. T. Quah, “Twin peaks: Growth and convergence in models of distribution dynamics,” The Economic Journal, vol. 106, no. 437, pp. 1045–1055, 1996.

[11] J. H. Ward, “Hierarchical grouping to optimize an objective function,” Journal of the American Statistical Association, vol. 58, no. 301, pp. 236–244, 1963.

[12] G. C. Chow, “Tests of equality between sets of coefficients in two linear regressions,” Econometrica, vol. 28, no. 3, pp. 591–605, 1960.

[13] B. L. Welch, “The generalization of ‘Student’s’ problem when several different population variances are involved,” Biometrika, vol. 34, no. 1–2, pp. 28–35, 1947.

[14] National Statistics Committee of the Republic of Uzbekistan. Official statistics on small business and private entrepreneurship. [Online]. Available: https://stat.uz

[15] N. Nazarov, “Buxoro viloyatida kichik biznes rivojlanishi ko‘rsatkichlarini statistik tahlil qilish va 2026–2030-yillarga ARIMA prognozi,” Iqtisodiyot va innovatsion texnologiyalar, vol. 14, no. 5, pp. 88–96, 2026, doi: 10.5281/zenodo.23690394.

[16] N. Nazarov, “O‘zbekistonda kichik biznes va xususiy tadbirkorlik sohasining iqtisodiy samaradorligini statistik baholash,” O‘zbekiston statistika axborotnomasi, no. 1, 2026.