IMPLEMENTATION OF PARETO ANALYSIS, ABC CUSTOMER CLASSIFICATION, AND CVP MODELLING AT AN INDUSTRIAL MANUFACTURING ENTERPRISE

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ABSTRACT

This study applies Pareto analysis, ABC customer classification, and cost-volume-profit (CVP) modelling to budgeting and financial decision-making at Saturn Metal LLC. Company records for 2023–2025 are used to examine customer concentration, changes in the relative contribution of major customers, and the relationship among revenue, variable costs, fixed costs, and break-even performance. The Pareto and ABC results show that a limited number of customers account for a substantial share of customer-register revenue, while the composition of the highest-contributing group changes markedly across the three years. The analysis therefore draws attention to customer retention, the development of medium-contribution customers, and exposure to individual major buyers. The CVP analysis identifies the break-even level and the margin of safety. The reported figures show a comparatively strong margin of safety in 2024 and a negative margin in 2025, when revenue fell below the break-even point. Taken together, the two analytical approaches provide a practical basis for budgeting, revenue planning, cost control, and risk assessment. Their combined use can support more disciplined managerial decisions while keeping customer concentration and operating risk visible within the budgeting process.

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Introduction

Effective budgeting and financial control are increasingly important for manufacturing enterprises in Uzbekistan as national development priorities emphasise higher-value production, digitalisation, resource efficiency, and competitiveness. These changes increase the need for financial planning systems that can respond to shifts in sales structure and cost behaviour. For manufacturing firms, budgeting therefore needs to connect customer-related revenue patterns with cost and profitability information so that resources can be allocated more rationally and operating risks identified earlier (Mirziyoyev, 2020, 2021).

Literature review. Budgeting and management accounting are well established in the international and domestic literature. Drury (2016) and Vakhrushina (2014) address core management-accounting concepts, while Uzbek authors discuss management accounting, budgeting, financial planning, and control (Abdusalomova, 2022; Hasanov et al., 2021; Hasanov & Hoshimov, 2011; Tashnazarov et al., 2022; Urazov, 2013).

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Musaeva (2022, 2024) also considers marketing communication and research relevant to customer-related managerial decisions. Taken together, the cited works provide the conceptual background for examining customer contribution and cost behaviour. The present study narrows this discussion to the practical application of Pareto analysis, ABC customer classification, and CVP modelling in one manufacturing enterprise.

Research methodology. The study uses a quantitative case-study design based on Saturn Metal LLC records and financial indicators for 2023–2025. Customer-revenue registers are analysed with Pareto analysis and ABC customer classification to examine concentration and year-to-year changes in customer contribution. The financial indicators reported in Table 6 are analysed through cost-volume-profit (CVP) modelling to assess the relationship among revenue, variable costs, fixed costs, contribution margin, the break-even point, and the margin of safety. The two analytical blocks are interpreted separately and then considered together as inputs to budgeting and managerial decision-making.

Results and discussion. For the present case, Pareto analysis is used to examine how customer revenue is concentrated across the customer base and how that concentration changes over time.

Saturn Metal LLC conducts transactions with a large number of customers whose contributions to revenue vary considerably. This makes cash-flow management and revenue budgeting less predictable, particularly when the composition of the following year's customer base changes. Identifying the customers with the greatest effect on sales and revenue therefore helps focus managerial attention on economically important relationships and provides a clearer basis for revenue planning.

Customer classification also supports the review of the customer portfolio, accounts receivable, and financial-planning priorities by distinguishing customers according to their relative economic importance.

In this paper, ABC customer classification is used alongside Pareto analysis to group customers according to their relative contribution to revenue. The term ABC is used here as a customer-segmentation classification rather than as a reference to activity-based costing or activity-based budgeting.

For the present analysis, the groups are interpreted as follows:

Group A contains the largest and most important customers. Together, they typically account for approximately 60–80% of revenue, although the group contains relatively few customers.

Group B contains customers of intermediate importance. Their individual contribution is lower than that of Group A customers, but the group remains significant to the overall revenue structure.

Group C contains customers with small individual shares. Their combined contribution may nevertheless remain material when the group is considered as a whole.

The following analysis applies Pareto analysis and ABC customer classification to Saturn Metal LLC's customer-revenue registers for 2023–2025.

Table 1.

Pareto Analysis of Top Clients for 2023

No.	Top Clients	Sum	Share	Group
1	MIRANKUL CONSTRUCTION MATERIALS LTD	1,200,000,000.00	7.9%	A
2	Shashlik Uz	1,196,703,250.00	7.9%	A
3	JAVOHIR BAKERY SHOP	1,000,000,002.16	6.6%	A
4	ENTER ENGINEERING	860,530,000.00	5.6%	A
5	WOODLANDS	857,360,000.00	5.6%	A
6	SHOXRUXJON SERVICE	798,387,000.00	5.2%	A
7	INNOCRAFT	732,760,000.00	4.8%	A
8	MIXT ROYAL PALACE MCHJ	600,000,000.00	3.9%	A
9	Stainless Steel Samarkand	516,935,001.62	3.4%	A
10	SABRINA VISOL SERVICE	429,650,000.02	2.8%	A
11	XUDOYORXON SHAMS XK	400,000,000.00	2.6%	A

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12	GRAND SAMARKAND SUPERIOR	311,860,000.00	2.0%	A
13	ENTER ENGINEERING PTE.LTD	302,980,000.00	2.0%	B
14	GASHSAN-LAZIZ	300,000,000.00	2.0%	B
15	TA`MINOT SERVIS BUXORO	299,635,000.00	2.0%	B
16	SHAXZOD PLAZA	284,760,000.00	1.9%	B
17	ENTER ENGINEERING PTE. LTD.	249,190,000.00	1.6%	B
18	MIRONKUL GROUP TOWER	238,400,000.00	1.6%	B
19	GENESIS EDUCATION	211,000,000.00	1.4%	B
20	NAVOBOD NASLLI PARRANDA	183,000,000.00	1.2%	B
21	MCHJ INNOCRAFT	160,703,357.95	1.1%	B
22	SAMARQAND MINTAQAVIY YO`LLARGA BUYURTMACHI XIZMATI	157,000,000.00	1.0%	B
23	MCHJ TOSH-ARIQ QURILISH SERVICE	150,000,000.00	1.0%	B
24	AFROSIYAB CHOYHONASI	150,000,000.00	1.0%	B
25	YAPP UBK AUTO SYSTEM	120,000,000.00	0.8%	B
26	BUNYOD CAPITAL INVEST SERVICE	112,970,000.00	0.7%	B
27	BOYOVUT TECHNO CLUSTER	112,130,000.00	0.7%	B
28	MCHJ 7-SONLI MEXANIZASIYALASHGAN KO`CHMA KOLONNA	112,000,000.00	0.7%	B
29	SPB Parliament	110,160,000.00	0.7%	B
30	PULSAR GROUP BREWERY	108,468,000.00	0.7%	B
	Other:	2,967,710,555.07	19%	C
	Result:	15,234,292,166.82	100%	

For this case study, the reported classification combines the classic 80/20 principle with a modified 60/40 grouping. Table 1 shows that, in 2023, the 12 largest customers accounted for approximately 60% of Saturn Metal LLC's customer-register revenue and were classified as Group A. Group B, shown in yellow, comprised 18 customers and accounted for more than 22% of the reported total. Group C comprised the remaining customers, each with a share below 0.6%. There were 76 such customers in 2023, and their combined contribution was 19%, so the group remained material in aggregate.

The 2023 classification identifies the customer relationships that warrant the closest managerial attention within the reported revenue structure.

Extending the Pareto–ABC analysis across several years reveals changes in the customer-revenue structure. It shows which customers remain in Group A, which lose relative importance and move to Groups B or C, and which move from lower-contribution groups into the highest-contributing category.

The same procedure was applied to the reported data for 2024 and 2025:

Table 2.

Pareto Analysis of Top Clients for 2024

No.	Top Clients	Sum	Share	Group
1	QORAKO`L STROY GROUP	1,500,007,872.00	16.8%	A
2	SAMARQAND XOLIS FAYZ SAVDO	1,500,000,000.00	16.8%	A
3	INTERACTIV PLANET	800,000,000.00	9.0%	A
4	HENGYUAN CEMENT	429,122,000.00	4.8%	A
5	DILKASH-SHIRIN-TAOM	353,300,000.00	4.0%	A
6	REIKARTZ U	335,050,500.00	3.8%	A
7	MEBEL-D	325,301,040.00	3.6%	A
8	SCHELKOVO AGROHIM-O`ZBEKISTON	314,526,000.00	3.5%	B
9	AZAM JAMSHID TAOMLARI MCHJ	300,000,000.00	3.4%	B
10	SOLOMON	288,205,000.00	3.2%	B
11	Shashlik Uz	228,333,333.00	2.6%	B

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12	SILK ROAD K OILAVIY KORXONA	200,000,000.00	2.2%	B
13	HAVAND-BEGZAD-KUNGRAD	185,000,000.00	2.1%	B
14	SUNNY VILLAGE	175,800,000.00	2.0%	B
15	NARPAYTEX	125,664,000.00	1.4%	B
16	Stainless Steel Samarkand	111,916,400.22	1.3%	B
17	SAMARKAND TOURISTIC CENTER MCHJ	109,539,997.94	1.2%	B
18	ZAMIN-TRAVEL	104,880,000.00	1.2%	B
19	MARKAZIY BANK SAMARQAND VILOYAT BOSH BOSHQARMASI	99,770,006.00	1.1%	B
20	NARZIKULOV DJURABEK MEBELLARI	70,000,000.00	0.8%	B
21	SHAXZOD PLAZA	60,000,000.00	0.7%	B
22	CHET EL KAPITALI ISHTIROKIDAGI "HAMKORBANK	53,500,000.00	0.6%	B
23	OQDARYO PLANKTON	53,000,000.00	0.6%	B
24	GO`SHT-SIFAT	52,362,000.00	0.6%	B
25	GENESIS EDUCATION	50,000,000.00	0.6%	B
26	FIBREGLASS	42,450,000.00	0.5%	B
27	SAM DILFIN	42,000,000.00	0.5%	B
28	SAMARKAND DIYORA LUX	40,000,000.04	0.4%	B
29	SAM VERO GROUP 999	40,000,000.00	0.4%	B
30	PURI AUTHENTIC GEORGIA BAKERY	35,900,000.00	0.4%	B
	Other:	908,309,109.01	10.2%	C
	Result:	8,933,937,258.21	100%	

The composition of Group A changed substantially from year to year, indicating considerable turnover among the highest-contributing customers (see Table 2).

In 2024, the top-customer group differed markedly from that reported for 2023. Mirankul Construction Materials, Shashlik Uz, and Javohir Bakery Shop held the leading positions in 2023, whereas Qorakol Stroy Group, Samarqand Xolis Fayz Savdo, and Interactiv Planet occupied the leading positions in 2024. Only a small number of customers recorded in 2023 also made purchases in 2024. These recurring customers are presented in Table 3.

Table 3.

Comparative analysis of the company's top clients and changes in their ABC groups in 2023–2024

		2023	2024	2023	2024	2023	→	2024
No.	Top Clients	Sum	Sum	Share	Share	Group		Group
1	Shashlik Uz	1 196 703 250	228 333 333	7.9%	2.6%	A		B
2	Stainless Steel Samarkand	516 935 002	111 916 400	3.4%	1.3%	A		B
3	SHAXZOD PLAZA	284,760,000	60,000,000	1.9%	0.7%	B		B
4	GENESIS EDUCATION	211,000,000	50,000,000	1.4%	0.6%	B		B
5	SAM VERO GROUP 999	29,250,000	40,000,000	0.2%	0.4%	C		B
6	ENTER ENGINEERING	860,530,000	34,000,000	5.6%	0.4%	A		C
7	DAKA-INTEX	21,000,000	17,882,000	0.1%	0.2%	C		C
8	MIRANKUL FOODS	48,825,000	17,175,000	0.3%	0.2%	C		C
9	CENTRAL ASIAN STAR	13,700,000	8,000,000	0.1%	0.1%	C		C

Table 3 identifies recurring customers and shows how their relative importance changed between 2023 and 2024. Shashlik Uz and Stainless Steel Samarkand moved from Group A to Group B. Their reported purchase values also declined, while larger customers appeared in the 2024 ranking. Enter Engineering, another major customer in 2023, recorded a substantial reduction in purchases and moved from Group A to Group C in 2024.

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Shaxzod Plaza and Genesis Education remained in Group B, while Daka-Intex, Mirankul Foods, and Central Asian Star remained in Group C with relatively small contributions to sales. Sam Vero Group 999 was the only recurring customer shown in Table 3 to move upward, from Group C to Group B.

Table 4.

Pareto Analysis of Top Clients for 2025

No.	Top Clients	Sum	Share	Group
1	SADRIDDIN	1,848,350,000.00	31%	A
2	NAVOBOD NASLLI PARRANDA	300,000,000.00	5%	A
3	STDHEALTHMED	278,990,000.00	5%	A
4	SANEG MART	264,000,000.00	4%	A
5	SAKINA RAXMON XAYOT	247,715,000.00	4%	A
6	RADIUS SERVICE	247,715,000.00	4%	A
7	SAMYAK	185,000,000.00	3%	A
8	REGISTON PLAZA	181,609,000.00	3%	A
9	SUNNY VILLAGE	169,810,000.00	3%	B
10	ZAMIN-TRAVEL	151,003,000.00	3%	B
11	ALEXANDER HOTEL	132,000,000.00	2%	B
12	NURSHOD OSHXONASI	125,500,000.00	2%	B
13	DIDI GROUP FOODS	125,000,000.00	2%	B
14	TOLIB BOBO AKT	108,790,000.00	2%	B
15	MAXSUS SUV QURILISH INVEST	105,397,300.00	2%	B
16	SAM-FERRE	102,250,580.00	2%	B
17	MALAXIT PLUS	100,000,000.00	2%	B
18	JIZZAX KELAJAK MAKTABI	98,560,000.00	2%	B
19	Stainless Steel Samarkand	96,934,000.00	2%	B
20	DILKASH-SHIRIN-TAOM	82,000,000.00	1%	B
21	NET PRODUKT LUX	80,700,000.00	1%	B
22	OHANGARON RISING SCHOOL	60,000,000.00	1%	B
23	HMC U	51,025,000.00	1%	B
24	XATAMOVA FAYYOZA UKTAM QIZI	50,000,000.00	1%	B
25	YAKUBOVICH PRODUCTS	47,120,000.00	1%	B
26	OLIY SIFAT PROM STROY	47,000,000.00	1%	B
27	MO'MINJON MA'RUFJON	39,000,000.00	1%	B
28	SHAMPOOR	33,075,000.00	1%	B
29	QADIROV MAMUR KARIMOVICH	33,000,000.00	1%	B
30	YUSUPOV TEHRON AZIZJON O'G'LI	33,000,000.00	1%	B
	Other:	576,443,920.00	9.6%	C
	Result:	6,000,987,800.00	100%	

The 2025 analysis again shows substantial turnover among the highest-contributing customers. Sadriddin became the largest customer and accounted for 31% of the reported total. This represents a pronounced concentration in a single customer, while the remaining customers recorded substantially smaller individual shares and purchase values.

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Table 5.

Comparative analysis of the company's top clients and changes in their ABC groups in 2024–2025

		2024	2025	2024	2025	2024	→	2025
No.	Top Clients	Sum	Sum	Share	Share	Group		Group
1	SUNNY VILLAGE	175,800,000	169,810,000	2.0%	2.8%	B		B
2	ZAMIN-TRAVEL	104,880,000	151,003,000	1.2%	2.5%	B		B
3	Stainless Steel Samarkand	111 916 400	96,934,000	1.3%	1.6%	B		B
4	DILKASH-SHIRIN-TAOM	353,300,000	82,000,000	4.0%	1.4%	A		B
5	EL-AZIZ	20,000,000	28,238,000	0.2%	0.5%	C		C
6	SOLOMON	288,205,000	26,000,000	3.2%	0.4%	B		C
7	ISTIQBOLLI TA'LIM	28,800,000	19,200,000	0.3%	0.3%	C		C
8	SAMARKAND QUALITY PRINT	2,050,000	6,050,000	0.0%	0.1%	C		C
9	ZILOL BAXT	28,775,600	5,520,000	0.3%	0.1%	C		C
10	SAMARKAND TOURIST CENTER	109,539,998	4,800,000	1.2%	0.1%	B		C
11	MUMIN OTA 1954	10,650,000	3,048,000	0.1%	0.1%	C		C

Of the 143 customers that made purchases in 2024, only 11 made repeat purchases in 2025. Most of these recurring customers remained in their previous ABC categories, although several moved between groups (see Table 5).

Dilkash-Shirin-Taom moved from Group A in 2024 to Group B in 2025. Solomon and Samarkand Tourist Center moved from Group B to Group C, reflecting substantial declines in their relative contributions.

These findings show how ABC customer classification can support budgeting by identifying the customers that contribute most to recorded revenue and by tracking changes in their relative importance. The results can therefore inform account review, customer-concentration monitoring, and the revenue assumptions used in budgeting.

From a managerial perspective, Group A customers warrant close monitoring because they account for the largest share of customer-register revenue. Retention initiatives may be considered for major one-off buyers, while Group B customers can be reviewed for opportunities to deepen commercial relationships. These are managerial implications of the observed customer structure rather than effects tested directly in the present study.

CVP modelling

Cost-volume-profit (CVP) modelling relates revenue, variable costs, fixed costs, and profit and is used to identify the break-even point (Drury, 2016). In budgeting, the model provides a structured basis for assessing the revenue required to cover costs and for evaluating the margin of safety.

Within the CVP framework, revenue first covers variable costs. The remainder is the contribution margin, which is available to cover fixed costs; profit is generated once total contribution exceeds fixed costs.

The model is first expressed in unit terms through the break-even condition:

$$P \times Q - VC_{unit} \times Q - FC = 0$$

where P is the unit selling price,

Q is the quantity of products sold,

VC_{unit}– variable cost per unit of output,

FC represents fixed costs.

Rearranging in terms of the contribution margin gives:

$$Q \times (P - VC_{unit}) - FC = 0$$

The break-even point in units can therefore be expressed as:

$$Q_{bep} = \frac{FC}{P - VC_{unit}}$$

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The model can then be expressed in monetary terms:

$$CMR = ((P - VC_{unit}) / P) = ((Revenue - VC_{total}) / Revenue)$$

$$S_{BEP} = FC / CMR$$

Here, CMR is the contribution margin ratio; the second line gives the break-even sales value in monetary terms.

The financial indicators reported by Saturn Metal LLC for 2023–2025 are used to calculate the critical CVP values shown in Table 6. These figures provide the basis for assessing the company's position relative to the break-even point in each year.

Table 6.

Calculation of the Break-Even Point and Margin of Safety of Saturn Metal LLC for 2023–2025

Indicator	2023	2024	2025
1. Revenue (S), thousand soums	**7,255,707.00**	**13,613,929.00**	**7,971,075.00**
2. Variable costs (VC), thousand soums	**6,423,656.00**	**12,463,398.00**	**7,196,327.00**
3. Fixed costs (FC), thousand soums	**750,206.00**	**913,223.00**	**786,643.00**
4. Contribution margin (CM), thousand soums	**832,051.00**	**1,150,531.00**	**774,748.00**
5. Contribution margin ratio (CMR)	**11.47%**	**8.45%**	**9.72%**
6. Break-even point, thousand soums	**6,541,996.74**	**10,805,926.21**	**8,093,457.94**
7. Margin of safety (MOS), %	**10.91%**	**25.99%**	**-1.51%**

In 2024, the break-even point increased sharply from 6,541,996.74 to 10,805,926.21 thousand soums. This change was associated with fixed costs of 913,223 thousand soums and a contribution margin ratio of 8.45%. Nevertheless, reported revenue in 2024 remained above the break-even point, producing a margin of safety of 25.99%.

Saturn Metal LLC operated above the break-even point in 2023 and 2024. In 2025, however, the margin of safety became negative (-1.51%), indicating that reported revenue fell below the break-even point by approximately 122,382.94 thousand soums (122,382,940 soums).

The CVP analysis shows how the reported revenue position changed in relation to the break-even threshold across the three years. The negative margin of safety in 2025 makes the break-even relationship particularly relevant to budgeting. CVP modelling can therefore support income and expenditure, cost-optimisation, and sales budgets by making the required operating threshold explicit.

Conclusion

Pareto analysis, ABC customer classification, and CVP modelling provide complementary views of Saturn Metal LLC's budgeting position. The customer analysis shows pronounced year-to-year changes among the highest-contributing accounts and continued concentration of recorded revenue in a relatively limited number of customers. The CVP results show that the company's position relative to break-even also changed across the period, with the margin of safety becoming negative in 2025. Considered together, these findings support closer monitoring of customer concentration, customer continuity, cost behaviour, and break-even performance when budgets are prepared.

The study is limited to one enterprise and to the three-year period covered by the supplied records. The findings should therefore be interpreted as case-specific and should not be generalised beyond the analysed company without additional evidence.

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