# Exploratory Data Analysis of Tenant Performance in MEGA Shopping Centers (IKEA Centres Russia), 2009–2011



*Mega Belaya Dacha shopping center, Moscow region, Kotelniki, 1 Pokrovsky lane,5*

# 1. Project Background.

This exploratory data analysis is based on real tenant sales and rent data from MEGA shopping centers (**IKEA Centres Russia) for the period 2009–2011** — a challenging time following the **2008 financial crisis.**

**My involvement** with the company began as a Supervisor in Debt Recovery, addressing critical arrears issues when many tenants struggled with payments due to the economic downturn. Over time, my role evolved into analytics, where I contributed to the **Tenant Performance Program** — an initiative aimed at improving tenants' business efficiency and overall shopping center performance.

The dataset was accessed through internal reporting systems during this period. Note that, due to the age of the data (over 15 years old), some fields contain limited availability of certain rent metrics or incomplete values (e.g., certain rent-related metrics or individual monthly sales for newly opened or closed tenants). These gaps were handled appropriately during data cleaning and do not affect the overall validity of the key insights.

The project demonstrates **SQL-based data cleaning, transformation, aggregation, and exploratory techniques, combined with Tableau for advanced visualization and interactive dashboards, applied to retail analytics**. The focus is on tenant performance, seasonality patterns, outlier detection, and the effectiveness of the turnover rent model.

# 2. Introduction.

The global **financial crisis of 2008** had a profound impact on the **Russian retail real estate market**, leading to a sharp decline in consumer spending, reduced credit availability, and widespread payment delays among tenants. In this challenging environment, shopping center operators faced critical arrears issues and the need to adapt rental models to maintain occupancy and revenue.

The object of analysis is **MEGA Belaya Dacha — a super-regional family shopping center** built in 2004 in 3 stages 1st Phase and 2nd Phase connected with the pedestrian bridge with a total gross building area **(GBA) of 303,000 m²** and gross leasable area **(GLA) of 225,000 m²** was the biggest shopping center in Europe. It featured **over 320 tenants**, anchored by major traffic drivers such as IKEA, Auchan, OBI, Stockmann, Media Markt, and Decathlon, alongside popular international brands including Zara, H&M, Topshop, Sephora, McDonald's, and others.

This exploratory data analysis examines tenant performance in MEGA shopping centers during the post-crisis recovery period of 2009–2011 — a time when flexible rent structures, including turnover-based components, played a key role in mitigating risks.

**The time period covered includes financial years 2010 and 2011**, with monthly data spanning from September 2009 to August 2011 (24 months total).

The primary goal of this analysis is to evaluate tenant sales performance and assess the effectiveness of the turnover-based rent model in generating additional revenue, while identifying opportunities to optimize the tenant mix for long-term success.

**Key business questions addressed:**

- How successful is the current tenant mix in driving overall shopping center performance?
- Are the tenant categories adequately represented, or do adjustments need to be made to better balance traffic and revenue?
- Which tenants act as the main traffic drivers, attracting visitors to the center?
- Which shops demonstrate the strongest business performance in terms of sales and efficiency?
- Which tenants underperform, and what factors contribute to their lower results?

- What actionable recommendations can be provided to optimize the tenant mix and enhance the center's profitability and visitor experience?

Using SQL for data cleaning, transformation, and aggregation, and Tableau for interactive visualizations and dashboards, the study provides actionable insights into retail performance during economic recovery.

# 3. Dataset description and Metadata.

The dataset, sourced from internal company reporting system Maconomy and presented by the EXCEL file, where all the data of rent rates and tenants' sales is stored. The dataset after cleaning and normalizing contains main metrics of 329 tenants of the shopping center for the period of FY 2010-2011:

- Tenant name, category, subcategory, leased area category – to categorize tenants according with premise size.
- Leased area in sq m, phase to which each tenant belongs. Mega Belaya Dacha shopping center's construction has been started in summer 2004, **Phase 1** has been put into operation in 2006, December 1 and **Phase 2** with pedestrian bridge in 2007, November 29. During the analysis the shopping center had been operating in full mode.
- Rent rate per square meter per year in **Russian rubles**.
- Monthly sales from **September 2009 to august 2011**.

# 4. Data Cleaning and standardization.

## 4.1. Incorrect Formats.

The initial data cleaning was performed in Excel to prepare the raw dataset for subsequent transformation and exploratory data analysis (EDA).

The raw file, sourced from the internal Maconomy reporting system, contained typical issues associated with historical retail data (2009–2011). The following steps were applied:

- **Error values (#N/A, #REF!)** were identified and replaced with NULL to accurately represent missing information from the source file.
- **Inconsistent date formats** were standardized from DD/MM/YYYY (or mixed variants) to the ISO-compliant YYYY-MM-DD format for start_date_tnr, end_date_tnr, and monthly sales column headers, ensuring full compatibility with SQL.
- **Currency symbols (₽, €)** were removed from monetary fields, and values were converted to clean numeric formats (integers/decimals) for accurate aggregation.
- **String inconsistencies,** including extra spaces, leading/trailing whitespace, and commas as thousand separators in numeric fields, were eliminated. Column names were also cleaned and renamed to remove special characters (!, "", ', etc.) for seamless SQL processing.

- **Column Renaming and Format Preparation for SQL Import.**
To ensure seamless integration with SQL analysis in DBeaver, the original Excel columns were carefully renamed and standardized. The following clean, consistent, and SQL-friendly names were applied:

All necessary format preparations were completed in the CSV file to guarantee smooth and error-free import into SQL:

The resulting CSV file is now fully compatible with DBeaver's import functionality, allowing reliable execution of all subsequent SQL queries without format-related errors or data loss.

## 4.2. Data standardization.

**Column Renaming and Format Preparation for SQL Import.**

To ensure accurate, reliable, and reproducible analysis in SQL and Tableau, the raw data underwent thorough standardization. This step eliminated inconsistencies typical for historical retail datasets exported from internal systems (2009–2011) with mixed manual input and different export formats.

The following key standardization procedures were applied:

- **Excel columns** were carefully renamed and standardized. The following clean, consistent, and SQL-friendly names were applied
- **Date formats** were unified to ISO 8601 (YYYY-MM-DD) across start_date_tnr, end_date_tnr, and all monthly sales headers. This guarantees correct sorting, grouping, and date functions in SQL.
- **Numeric values** (rent rates, leased area, sales) were converted to clean DOUBLE format:
    - Removed currency symbols (₽, €)
    - Removed thousands of separators (spaces, commas)
    - Replaced error values (#N/A, #REF!) with NULL
    - Ensured consistent decimal separator (point) and correct decimal format for all sales figures
- **Text fields** (tenant_name, category, subcategory, etc.) were trimmed of leading/trailing whitespace, extra spaces, and special characters. Category and subcategory names were standardized to Title Case for consistent grouping and filtering.
- **Categories, subcategories, and build phase** were fully standardized:
    - Category and subcategory names brought to uniform Title Case and consistent spelling
    - Build phase values normalized to numeric format: 1 or 2 (Phase 1 and Phase 2).

All these transformations were performed in Excel before saving to CSV and importing into DBeaver. The resulting CSV file is now fully compatible with DBeaver's import functionality, allowing reliable execution of all subsequent SQL queries without format-related errors or data loss.

This standardization step was crucial to preserve data integrity, avoid miscalculations (especially in OCR, turnover rent, and time-based metrics), and enable accurate downstream analysis of tenant performance across phases and time periods.

The cleaned and standardized CSV file serves as the single source of truth for all further processing and visualization. *Appendix 1* contains detailed description of the file and metadata.

## 4.3. Duplicate Records.

Duplicates were a significant issue in the raw dataset, primarily due to the shopping center's practice of maintaining separate records for multiple rental units occupied by the same tenant (e.g., different premises or contracts under one brand name). These duplicates appeared across multiple rows for the same tenant name, often with overlapping or complementary data.

**Detection method**: Conditional formatting in Excel was applied to quickly identify repeated tenant names, followed by grouping and validation checks to confirm true duplicates.

**Handling strategy**: To eliminate redundancy while preserving business accuracy, duplicates were merged intelligently:

**Turnover percentage (% TNR)**: Retained the value from the record with the largest leased area or the most recent contract (if applicable), as this typically reflected the primary or updated agreement.

**Leased area**: Summed across all duplicate records to represent the tenant's total occupied space.

**Rent**: Where rent rates were identical across units, the value was kept as is. In cases of different rates, a weighted average was calculated using the formula: (rent1 × leased_area1) + (rent2 × leased_area2) / (leased_area1 + leased_area2)

**Monthly sales**: Aggregated by summing the sales figures across all duplicate records, ensuring the tenant's full contribution was captured.

This merging process reduced the dataset from over 350 rows to 329 unique tenants, eliminating artificial inflation of metrics while maintaining data integrity and business relevance. The result is a clean, accurate representation of each tenant's footprint and performance in the shopping center. The mechanism is described in *Appendix 2.*

## 4.4. Data Limitations.

| category | total_tenants_in_category | tenants_with_missing_rent | missing_rent_% |
|---|---|---|---|
| Anchors | 4 | 2 | 50 |
| Beauty sector | 11 | 3 | 27.3 |
| Other retail | 19 | 4 | 21.1 |
| Services | 10 | 2 | 20 |
| Jewelry & clocks | 20 | 3 | 15 |
| Sporting goods | 14 | 2 | 14.3 |
| Entertainment | 7 | 1 | 14.3 |
| Shoes | 33 | 4 | 12.1 |
| Food | 38 | 4 | 10.5 |
| Children goods | 20 | 2 | 10 |
| Clothing | 132 | 10 | 7.6 |
| Home appliances | 14 | 0 | 0 |
| Home accessories general | 7 | 0 | 0 |

The analysis identified **37 tenants (approximately 11% of the total 329 tenants)** with missing or zero values in the rent_sqm field (i.e., no rental rate information available), for detailed information please see *Table 3*. These gaps are distributed across categories as follows:

**Anchors** stand out with the highest risk: **50%** of anchor tenants (2 out of 4) have missing rent information. These are the largest traffic drivers (IKEA, Auchan) and occupy the biggest share of GLA. Incomplete data for half of them significantly limits accurate revenue forecasting, occupancy cost ratio (OCR) calculations, and overall financial performance evaluation.

**Beauty sector (27.3%)** and **Other retail (21.1%)** also show substantial gaps: These categories, while smaller in number, contribute to high footfall and impulse purchases. Missing rent rates here make it difficult to assess true category profitability and stability.

**Services (20%), Jewelry & clocks (15%), Sporting goods (14.3%), and Entertainment (14.3%)** follow with moderate levels of missing data. These lifestyle and leisure categories are important for dwell time and visitor experience, but incomplete financial information reduces the precision of performance benchmarking.

Core categories — **Shoes (12.1%), Food (10.5%), Children goods (10%)**, and especially **Clothing (only 7.6%)** — have relatively low levels of missing rent data, which is positive given their dominant role in tenant count and sales volume. Key categories with zero missing data: **Home appliances and Home accessories general (both 0%)** — these tenants appear to have complete and accurate rent records.

**Overall takeaway**: The absence of rent rate information is most critical in Anchors (50% missing) — the very foundation of traffic and revenue. Moderate gaps in Beauty, Other retail, and Services also deserve attention, as they affect impulse and lifestyle spending. The low missing rate in Clothing and Food (the two largest categories) is reassuring and indicates better data quality in high-volume areas.

**Recommendation:** Prioritize retrieving complete rental contracts for anchor tenants and high-footfall categories (Beauty, Services) to ensure accurate revenue modeling and risk assessment. Establishing mandatory data validation during lease administration will help prevent such gaps in the future.

This analysis highlights the importance of complete financial data for strategic decision-making, especially in a super-regional family shopping center like MEGA Belaya Dacha.

## Imputing Rent Rates for Tenants with Missing Data

To ensure a complete and reliable analysis of occupancy cost ratios (OCR) and rental revenue, rent rates were imputed for tenants where data was missing or zero. The imputation used the **average rent per square meter** within the same subcategory (and where necessary, category) as a proxy, reflecting typical market rates for similar premises in Phase 1 and Phase 2.

For the 37 tenants with missing rent_sqm values, rates were imputed using subcategory averages (calculated from tenants with valid data), see *Appendix 3* for detailed comments and SQL queries.

The imputation was performed using **average rent per square meter within the same subcategory and size category (Category_sqm)**. This approach ensures higher precision: comparing or averaging rates across premises of significantly different sizes (e.g., 40 m² vs 200 m² in the same subcategory) would be misleading, as smaller units typically command higher rates per m² due to location, visibility, and operational factors.
The table below shows a representative sample of tenants with originally missing rent data and the imputed rent_sqm values applied:

- **Anchors** — e.g., IKEA (3,000 RUB/m²) – as a **unique tenant**, which presents only in MEGA shopping center and Auchan (4,500 RUB/m²) received conservative, below-market rates typical for large-format anchors.
- **Beauty & Health** —imputed rates (e.g., 74,597 RUB/m² for Dlya Dusha i Dushi, 72,796 RUB/m² for Riga Soap).
- **Fashion & Accessories** — rates range from 14,000 RUB/m² (Camaieu, Gizia) to 41,600 RUB/m² (Bench).
- **Food & Specialty** —rates (e.g., 31,300 RUB/m² for Starbucks, 60,540 RUB/m² for Musetti) align with high-turnover, quick-service models.

The two largest anchor tenants — **IKEA** (32,108 m²) and **Auchan** (20,140 m²) — required special consideration. Their leased areas significantly exceed those of **OBI** (16,973 m²) and **Stockmann** (14,200 m²), and anchor tenants typically negotiate substantially lower rates per m² due to their role as primary traffic drivers and volume commitments.

**Stockmann,** as a premium department store, operates in a higher pricing segment and is not directly comparable to mass-market anchors like **IKEA and Auchan**.

Therefore, for these two anchors, rent_sqm values were not imputed from internal subcategory averages. Instead, market benchmarks from the period 2010–2011 were applied:

- According to Knight Frank's "Moscow Retail Market Overview H1 2011", anchor tenant rates in high-quality regional shopping centers ranged from **100–300 USD/m²/year** (excluding OPEX and VAT).

- For large-format hypermarkets and furniture/home improvement anchors (e.g., IKEA, Auchan, OBI), rates typically fell in the lower end of this range: **100–200 USD/m²/year** (Knight Frank, 2011; similar figures reported by Colliers International and CBRE in 2010–2011 Moscow retail reports).

Based on this external market data and considering the tenants' strategic importance and GLA size, an estimated rent_sqm of **150 USD/m²/year** (mid-range for large anchors) was applied **to Auchan** department store and **100/m²/year to IKEA** as its unique tenant which is presented only in MEGA shopping centers for analytical purposes. Taking into consideration the average exchange rate 30 rubles per 1 USD, the rates will be **4500 and 3000 per m2 per year respectively**. This conservative estimate aligns with industry benchmarks for the post-crisis recovery period.

Knight Frank (2011). Moscow Retail Market Overview H1 2011.
Available at: https://content.knightfrank.com/research/598/documents/en/kfretailmarketoverviewh12011eng-2123.pdf

**Special Rent Rate Adjustments for Selected Jewelry Tenants**

During the rent rate review, two notable outliers were identified and corrected in the jewelry category to ensure realistic and consistent assumptions:

- **Pilgrim** and **Diadema** are the smallest jewelry tenants in terms of premise size (both under 50 m²). Unlike well-known international brands such as Swarovski, which typically benefit from preferential rates due to brand recognition and traffic generation, Pilgrim and Diadema do not qualify for such conditions. Therefore, a standard market-aligned rent rate of **180,000 RUB per year** was applied.
- **KOTON** was detected as another outlier with an unrealistically low rent rate of **1,000 RUB per m² per year** — clearly a data entry error. To correct this, the rate was adjusted to a more realistic **10,000 RUB per m² per year**, in line with typical rates for mid-tier clothing tenants in the center.

These manual corrections maintain fairness in the analysis and prevent distortion of key metrics such as OCR and turnover rent calculations. They reflect standard market practices: premium/anchor brands may receive discounts, while smaller or less prominent tenants are charged closer to average rates.

**Key Insight**: By calculating averages at the intersection of subcategory and size category (Category_sqm), the imputation process minimized distortion and provided more reliable OCR estimates. Categories with high imputed rates (e.g., Beauty, Jewelry) often face elevated occupancy costs, while anchors and food tenants benefit from significantly lower effective rates. This adjustment strengthens the validity of the overall revenue and performance analysis without introducing significant bias.

## 4.5. Summary of actions taken.

| Problem | Before cleaning | After Cleaning | Actions taken |
|---|---|---|---|
| Date format | 09/30/2009 | 2009-09-30 | Rename date format |
| Missing sales / Null sales | NULL in 15% of rows | 0 for new and closed tenants | Find / replace |
| Symbols in tenant names | APTEKA 36,6, 1C: INTERES | APTEKA 366, 1C INTERES | Find / replace |
| Total rows number | 400+ | 329 (unique rows) | Check duplicates |

**Missing rent information implementation (the synthesized data is shown):**

| tenant_name | category | subcategory | Category_sqm | leased_area | rent_sqm |
|---|---|---|---|---|---|
| IKEA | Anchors | Anchors | Anchors | 32108 | 3000 |
| AUCHAN | Anchors | Anchors | Anchors | 20140 | 4500 |
| SEPHORA | Beauty sector | Cosmetics | 250<X<500 | 452 | 45000 |
| DLYA DUSHA I DUSHI | Beauty sector | Health and wellness | <50 | 42 | 74597 |
| RIGA SOAP MANUFACTURE | Beauty sector | Health and wellness | <50 | 16 | 72796 |

# 5. Data Overview.

At the time of analysis, the gross **leased area** of MEGA Belaya Dacha stood at **209,834 m²**, compared to the total declared GLA of **225,000 m²** according to the shopping center's official description. This difference results in a **vacancy rate of approximately 6.7%**. Considering the challenging post-2008 financial crisis context, when many Russian shopping centers experienced vacancy rates of 10–15% or higher, a 6.7% vacancy rate represents a **strong performance indicator**. It reflects MEGA's resilience, effective tenant management, and the success of the turnover-based rent model in maintaining high occupancy even during economic recovery. This low vacancy level underscores the center's ability to retain tenants and attract new ones, contributing to stable revenue and continued visitor appeal in a difficult market environment.

The main descriptive features are as follows:

- **Total number of tenants**: 329 unique tenants
- **Duplicate check**: No duplicate tenant_name entries were detected
- **Number of business categories**: 13 main categories
- **Number of business subcategories**: 51 detailed subcategories
- **Number of area size categories**: 9 size bands (Category m² groups)

This structure reflects a diverse and well-segmented tenant mix, typical for a large regional shopping and family entertainment center. The methodology is reflected in *Appendix 4.*

# 6. Data Transformation.

## 6.1. Calculation of Key Business Metrics.

1. **Rent per Year.**

- **Formula**: rent_per_year = rent_sqm × leased_area

- This represents the **annual fixed rent** paid by the tenant based on their occupied space.

- The metric serves as the foundation for occupancy cost calculations and revenue forecasting for the shopping center.

2. **Total sales for Financial Years 2010 and 2011.**

Sales figures were directly aggregated from monthly data columns.

**FY 2010**: September 2009 – August 2010

**FY 2011**: September 2010 – August 2011

For tenants with partial-year occupancy (e.g., late openings or early closures), sales were used as reported, reflecting only the actual period of operation.

### 3. Occupancy Cost Ratio (OCR) for FY 2010, 2011.

OCR FY2010 = rent_per_year / sales_fy2010 × 100

OCR FY2011 = rent_per_year / sales_fy2011 × 100

OCR shows the **percentage of tenant turnover spent on fixed rent** — a critical indicator of financial health and sustainability.

**Important note on scope**: In standard retail practice, total occupancy costs include not only fixed rent, but also common area maintenance (CAM), utilities, marketing fees, and other operating expenses. Unfortunately, the dataset lacks detailed information on these additional charges (CAM, electricity, water, etc.). Therefore, the calculated OCR reflects **only the fixed rent component**, making it a conservative (underestimated) measure of the real burden on tenants.

**Key Takeaway:**

By prorating rent where necessary, correcting obvious input errors, and clearly documenting limitations (absence of CAM and utilities), the OCR calculations provide a reliable proxy for tenant burden during the post-crisis recovery period. High OCR tenants remain flagged as potential risks, but the adjusted figures now offer a more accurate foundation for assessing the effectiveness of MEGA's turnover rent model.

### 4. Turnover natural breakpoint.

**Turnover Natural Breakpoint (TNR NB)** – a mechanism that makes leasing mutually beneficial.

**In the IKEA Centres Russia (MEGA)** leasing model, rental payments consist of two components:

- **Fixed rent (rent_per_year)** – a base amount paid by the tenant regardless of sales performance

- **Turnover rent (TNR)** – an additional percentage-based fee applied only after the tenant reaches a certain sales threshold.

This threshold is called the Natural Breakpoint (TNR NB) and is calculated using the following formula:

**TNR NB = rent_per_year / (TNR% / 100)**

### 5. Turnover rent.

**Turnover rent (TNR)** – is an additional percentage-based rent fee applied only after the tenant reaches Natural Breakpoint and calculated **only on the portion of sales that exceeds the breakpoint** (i.e. on the difference between actual sales and the Natural Breakpoint), not on the entire turnover.

This mechanism ensures fairness: the tenant continues to benefit from sales up to the breakpoint without extra charges, while the center starts receiving a share of the incremental revenue only when the tenant performs above the expected minimum level.

Exceeding the natural breakpoint at which the turnover fee begins to apply.

**Turnover fee = (yearly sales – natural breakpoint) * %TNR / 100**

In this way the shopping center starts receiving a percentage of turnover (TNR%) on top of the fixed rent. This creates a classic win-win situation:

- The tenant pays more only when they are genuinely successful and generating higher revenue

- The center earns additional income from high-performing brands, incentivizing them to grow

Why turnover rent is valuable for the shopping center

Turnover rent is not just an "extra income stream". It serves as a powerful indicator of tenant success:

- The higher the share of turnover rent in total rental income – the more successful the tenants are

- The more tenants cross their breakpoint – the higher the overall center turnover and footfall

- It creates natural alignment: the center is motivated to drive sales for every tenant (marketing, traffic, events), rather than simply collecting fixed rent

ADIDAS is a textbook positive example: Sales growth → breakpoint comfortably exceeded → center received 3.5× more turnover rent → tenant reduced OCR from 10% to 7% (paying a lower relative share of revenue)

This is the core strength of the modern retail leasing model: instead of "squeezing" maximum fixed rent, the center earns together with successful tenants. When many brands consistently cross their breakpoint and demonstrate sales growth, the entire shopping center becomes more resilient, profitable, and attractive.

**Note**: Full list of imputed values, detailed methodology, and underlying SQL queries for key business metrics from point 2 to 6 are provided in *Appendix 5.*

# 6.2. Creation of Aggregate Metrics.

To transform raw tenant-level data into actionable business insights, a set of aggregated metrics was derived at tenant, category, subcategory, and center-wide levels. These metrics support performance benchmarking, phase comparison, turnover rent effectiveness, and strategic decision-making.

The following key metrics were calculated:

- **Total Leased Area (GLA)** — sum of leased_area across all tenants (center-wide and per category). Used to analyze vacancy rates, space utilization, and overall center capacity.
- **Total Annual Sales** — sum of sales_fy2010 and sales_fy2011 per tenant, per category, and overall. Measures absolute revenue contribution of individual tenants and categories, revealing top revenue drivers and growth trends.
- **Total Fixed Rent** — sum of rent_per_year (baseline fixed obligation). Represents the guaranteed rental income stream, serving as the foundation for evaluating the center's fixed revenue stability.
- **Total Turnover Rent (TNR Fee)** — sum of turnover_fee_2010 and turnover_fee_2011 (actual variable rent paid). Quantifies additional performance-based income, highlighting the success of the turnover rent model.
- **Total Rent Paid** — sum of fixed rent + turnover rent per year (grand_total_rent_2010_2011). Provides the complete rental income picture per tenant, category, and fiscal year.
- **Turnover Income (Incremental Rent)** — turnover_fee – fixed rent (net additional income from the turnover model). Shows how much extra revenue the center gained beyond fixed obligations, directly measuring the value added by the variable rent mechanism.
- **Turnover Share in Total Rent** — (turnover_fee / total rent) × 100%. Indicates the proportion of rental income that is performance-based, reflecting tenant success and the center's reliance on variable rent.

- **Average / Median Rent per sqm** — average and median rent_sqm per subcategory and Category_sqm group. Median is preferred for typical rate analysis (less affected by outliers), while average shows overall pricing level; used to benchmark fairness, identify under/overpriced tenants, and inform new lease negotiations.
- **Sales Density** — total sales / total leased area (RUB/m²/year). Key retail performance indicator — measures how efficiently each square meter generates revenue; higher values indicate strong tenant productivity and center attractiveness.
- **Occupancy Cost Ratio (OCR)** — (total rent paid / total sales) × 100%. Recalculated at tenant and aggregated levels to assess tenant affordability and sustainability; high OCR signals risk of vacancy, low OCR indicates healthy profitability.
- **Average TNR% by Category/Subcategory** — average turnover rent percentage across tenants in each group. Reveals category-specific rent structures; higher averages indicate stronger performance-based incentives and better alignment with sales growth.

These aggregated metrics provide a comprehensive view of tenant and center performance, enabling identification of high-performing categories, evaluation of the turnover rent model effectiveness, detection of risk areas, and formulation of data-driven recommendations for tenant mix optimization, rent adjustments, and Phase 2 expansion impact assessment.

Appendix 6 contains detailed information on how the aggregate metrics were calculated, including formulas, aggregation logic (tenant, category, subcategory, and center-wide levels), and SQL examples used in DBeaver. Refer to **Appendix 6** for complete technical specifications and methodology.

# 6.3. Month-Level Transformation and Seasonality Preparation.

- **Gross monthly turnover by subcategory**: Total monthly sales aggregated per subcategory. This indicator shows the overall contribution of each subcategory to the center's revenue stream, highlights seasonal peaks (e.g., December holiday shopping, August–September back-to-school), and reveals which subcategories drive the highest absolute turnover volume month by month.
- **Average monthly turnover per tenant by subcategory:** Average sales per tenant within each subcategory per month. This metric reflects the typical performance of a single tenant in a given subcategory, allowing comparison of efficiency across subcategories. It helps identify which subcategories generate the highest average revenue per store (e.g., high-ticket categories like Jewelry vs high-frequency categories like Food) and tracks the main trend in per-tenant sales growth or decline over time.
- **Percentage of zero-sales months by tenant**: The share of months (out of 24) during which a tenant recorded zero sales. This indicator measures tenant reliability and operational stability. High percentages signal potential issues such as ramp-up periods for new tenants, seasonal closures, low traffic locations, or financial/operational difficulties. It is a key risk metric, helping to identify tenants that may require additional support, renegotiation, or replacement to minimize vacancy and revenue loss.

Together, these monthly indicators complement annual aggregates by uncovering short-term fluctuations, seasonal patterns, per-tenant efficiency, and operational risks, enabling more precise recommendations for tenant mix optimization, marketing focus, and rent strategy adjustments. The list of SQL queries is reflected in *Appendix 7.*

# 6.4. Outlier Flagging and Handling.

To ensure the reliability and interpretability of key performance metrics (rent per sqm, Occupancy Cost Ratio — OCR, and OCR trends), a systematic approach was applied to identify and flag outliers.

## Methodology

1. **Rent per sqm Outlier Detection** A dedicated temporary table min_max_rents was created using window functions (ROW_NUMBER) to identify the tenants with the **minimum** and **maximum** rent per sqm within each homogeneous peer group (defined by subcategory and Category_sqm). Only groups with ≥2 tenants were considered to guarantee meaningful comparisons.
2. **Summary Statistics per Group** A complementary table ranges_table was generated to provide context:
   o Total leased area
   o Number of tenants
   o Average rent per sqm
   o Min / Max rent per sqm
   o Rent range (max – min)

   These metrics allow stakeholders to quickly assess the spread of rental rates within each subcategory and size band.

3. **Final Joined View** The two tables were left-joined to produce rents_ranges, a single, enriched view combining extreme tenant details with group-level statistics. This table serves as the primary source for outlier review and benchmarking.

## Key Observations

- **Extreme rental rate dispersion** was detected in several subcategory–size combinations. Groups with large rent_range values indicate significant pricing inconsistencies, which may reflect negotiation power differences, location premiums, legacy contracts, or data quality issues.
- The methodology ensures outliers are evaluated **relative to peers** (not portfolio-wide), making the flagging process more accurate and defensible.

## OCR Outlier & Trend Handling

1. **Adjusted OCR Calculation** Raw OCR values were recalculated on a **pro-rated basis** to account for partial-year occupancy (using start_date_tnr and fiscal year-end dates). This adjustment eliminates distortions caused by tenants who joined or left mid-year.
2. **OCR Trend Classification** A refined, business-oriented logic was implemented to categorize year-over-year OCR changes (ocr_2011_pct – ocr_2010_pct):

| Category | Change Threshold | Interpretation / Action Recommended |
|---|---|---|
| Critical Deterioration | > +100% | Tenant survival risk — urgent lease review / renegotiation required |
| Severe Deterioration | +50% to +100% | High concern — strong profitability pressure, monitor closely |
| Moderate Concern | 0% to +50% | Mild worsening — watchlist, potential early intervention |
| Stable | ≈ 0% | Consistent performance — no immediate action |
| Improvement | < 0% | Positive development — cost efficiency gains |

3. **Special Handling for New / Zero-Base Tenants** (ocr_2010 = 0 or NULL)

| Change Threshold | Category | Business Interpretation |
|---|---|---|
| > +50% | High Startup Risk | Costs escalated too fast relative to sales — high failure risk |
| 0% to +50% | Moderate Startup Phase | Normal ramp-up period — monitor, but not alarming |
| < 0% | Improvement | Rare, but indicates very strong initial sales performance |

**Business Value**

This structured outlier flagging and trend categorization framework enables:

- Early identification of tenants at risk of financial distress
- More accurate peer benchmarking of rental rates
- Prioritization of lease renegotiation, retention, or replacement actions
- Improved forecasting of portfolio cash-flow stability

The methodology is fully reproducible, documented in SQL, and can be refreshed automatically as new fiscal data becomes available in *Appendix 8*.

# 7. Exploratory Data Analysis (EDA).

## 7.1. Introduction.

**Objective** The primary goal of this analysis is to gain a deep understanding of the shopping center's data structure, identify anomalies and risks, uncover key income drivers, and evaluate the current operational and financial situation. These insights aim to support informed short-term tactical decisions (e.g., rent adjustments, tenant risk management) and long-term strategic planning (e.g., tenant mix optimization, Phase 2 performance evaluation, and turnover rent model enhancement).

**Main Data Source** The core dataset originates from the internal IKEA Centers Russia Maconomy system — specifically, the tenant master table containing detailed records on:

- Tenant profiles (name, category, subcategory, premise, leased area, build phase)
- Contractual terms (rent per sqm, fixed rent, TNR percentage, natural breakpoint)
- Performance metrics (monthly and annual sales FY 2010–2011, turnover fees)

**Analytical Focus & Key Metrics** The analysis centers on three fundamental pillars of shopping center performance:

**Rent Structure & Tenant Affordability**
- Fixed and variable rent components
- Rent per sqm distribution by category, subcategory, and premise size
- Identification of outliers (unrealistically low/high rates) and manual corrections (e.g., KOTON 1,000 → 10,000 RUB/m²)

**Occupancy Cost Ratio (OCR)**
- Calculated as (total rent paid / total sales) × 100%
- Evaluated at tenant, category, and center-wide levels
- Used to assess tenant financial health, sustainability, and risk of vacancy (high OCR >25–30% flagged as critical)

**Turnover Rent Share & Effectiveness**
- Turnover fee contribution (actual variable rent paid)
- Turnover share in total rent = (turnover fee / total rent) × 100%
- Number and percentage of tenants exceeding natural breakpoint
- Incremental income from the performance-based model (turnover fee – fixed rent)
- These metrics were analyzed both annually (FY 2010 vs FY 2011) and monthly to capture seasonality, phase differences (Phase 1 vs Phase 2), and tenant reliability (zero-sales months). The combination of

fixed rent stability, variable rent upside, and OCR risk profiling provides a holistic view of current performance and future growth levers.

This structured approach transforms raw tenant data into clear, actionable business intelligence, supporting decisions on rent policy, tenant retention, category rebalancing, and maximization of turnover rent potential in a post-crisis recovery environment.

# 7.2. General description.

Data will be calculated using main groups as: categories, subcategories and categories of sqm, what will give opportunity to handle detailed analysis of main metrics.

- **Number of business categories**: 13 main categories
- **Number of business subcategories**: 51 detailed subcategories
- **Number of area size categories**: 9 size bands (Category m² groups)

**Distribution of leased area by premise size**



Leased Area Allocation by Size Category.
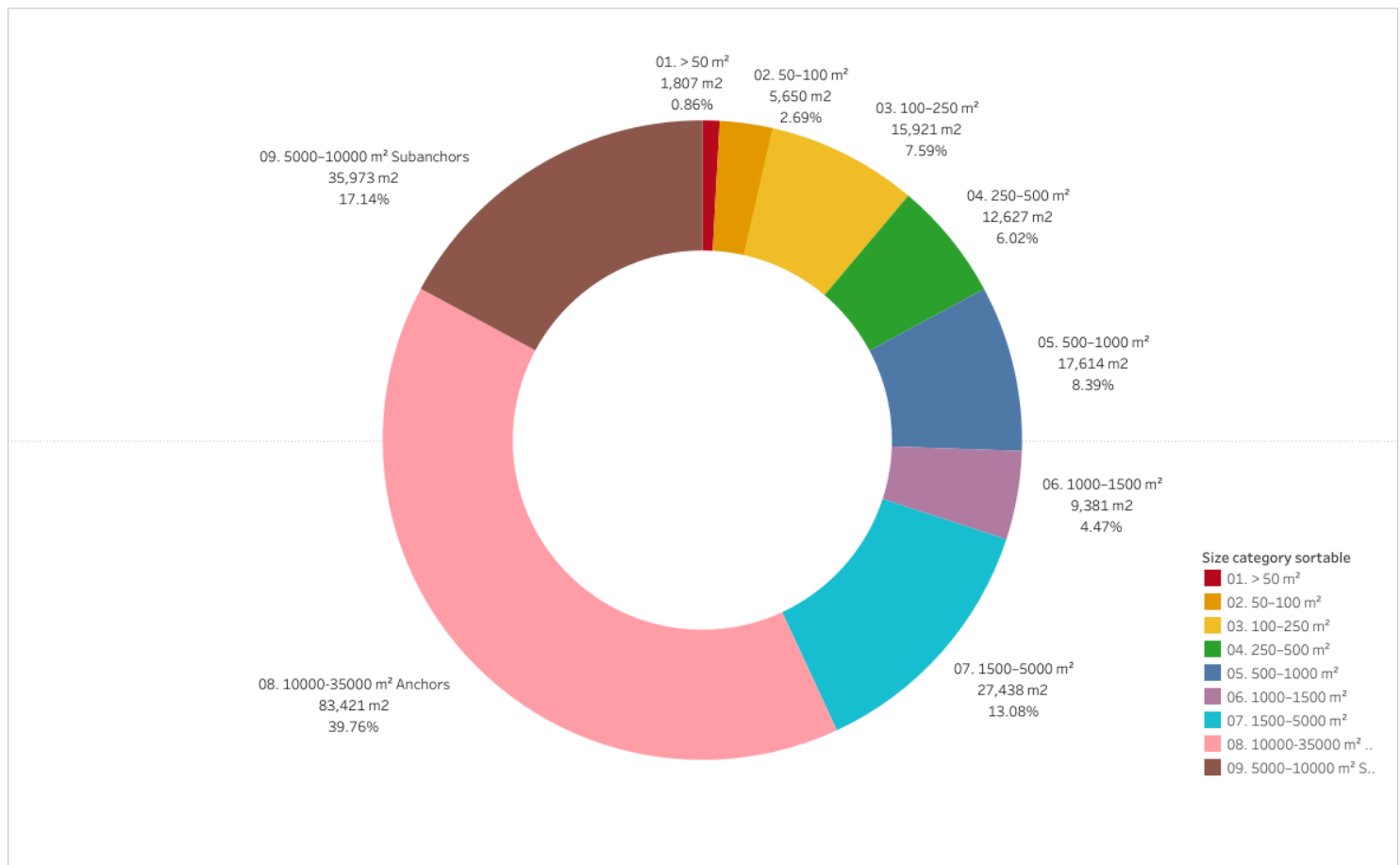
The total gross leasable area **(GLA)** of the shopping center stands at **209,834 m².** The distribution of occupied leased area across premises size categories reveals a clear dominance of large-format and anchor tenants:
- **Anchors (10,000–35,000 m²)** occupy the largest share — **39.8% (83,421 m²)**, serving as the primary traffic generators and core of the center's offering.
- **Sub-Anchors (5,000–10,000 m²)** contribute 17.1% **(35,973 m²)**, reinforcing the strong mid-to-large tenant presence.

- **Mid-sized premises (1,500–5,000 m²)** account for **13.1% (27,438 m²)**, while the **500–1,000 m²** and **100–250 m²** segments together represent **16.0% (33,535 m²)**.
- Smaller formats **(<100 m²)** occupy only **3.6% (7,457 m²)**, typical for boutique, kiosk, and specialty retail.

This structure highlights a highly anchor-driven tenant mix, where large-format tenants control nearly 57% of occupied GLA (Anchors + Sub-Anchors). The relatively low share of small premises (under 100 m²) indicates limited exposure to high-density, impulse-driven retail, while the significant mid-to-large segment supports long dwell time and family-oriented shopping behavior.

The allocation reflects a strategic focus on major anchors and sub-anchors to ensure high footfall and revenue stability, with smaller formats playing a complementary role.

**Share of premises area in each category.**



Leased Area Distribution by Business Category and Premises Size.
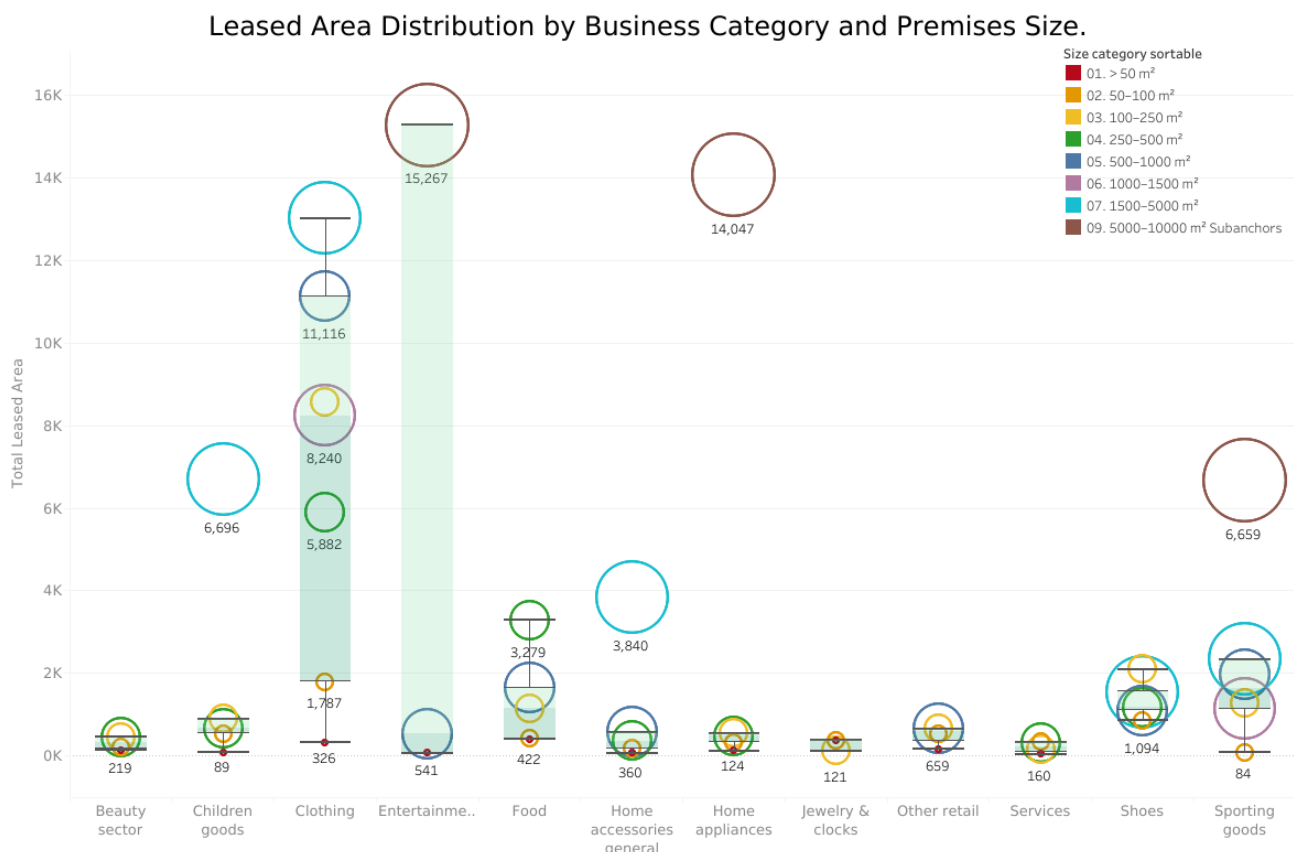
The chart illustrates the allocation of occupied leased area across business categories and premises size bands (excluding Anchors tenants due to their dominant scale).

**Key observations:**

- **Anchors**, which alone account for approximately **39.8%** of total GLA, were excluded from the visualization. Their combined occupied area (~80,000 m²) significantly exceeds the scale of other categories and would distort chart readability.
- The **5,000–10,000 m²** category, corresponding to Sub-Anchors, is represented in several business categories:
  - Entertainment — Cosmik and Kinostar cinema (~15,267 m² in total)
  - Home appliances — M.Video and MediaMarkt (~14,047 m² in total)
  - Sporting goods — Decathlon (6,659 m²) These tenants play a crucial role in traffic generation and overall business efficiency of the shopping center and will be analyzed separately during EDA.
- The **1,500–5,000 m²** category is spread across multiple business categories:
  - Children goods — major market players Detsky Mir and the newly entered brand Deti (6,696 m² in total)

- o Clothing (~13,004 m² in total) — well-known upper-middle brands such as ZARA, H&M, C&A, Lady & Gentlemen City, etc.
  - o Home accessories — Yuterra (3,840 m²)
  - o Shoes — the largest premise in this size band City Obuv (1,558 m²)
  - o Sporting goods — Sportmaster (2,340 m²), one of the key traffic generators in shopping centers.
- The **1,000–1,500 m²** category shows strong presence in:
  - o Clothing — Uniqlo, Topshop, M&S, New Yorker
  - o Sporting goods (up to ~9,400 m² in total)
- The **500–1,000 m²** category is represented in Clothing, Entertainment, Food, Shoes, and Sporting goods, occupying mid-tier volumes (up to ~15,840 m² in total).
- The **250–500 m²** category is mainly present in the Food category (up to ~3,279 m² in total).
- Smaller premises (**<500 m²**) are more evenly distributed across categories such as Clothing, Beauty sector, and Home appliances, while smaller categories (Jewelry & clocks, Shoes, Services) represent significantly lower footprints (under 2,000 m² each).

This distribution highlights a **diversified but category-dominant** tenant mix outside of anchors: fashion and entertainment categories control the majority of mid-to-large space, while specialty retail and services occupy smaller, high-density niches. The exclusion of anchors allows for clearer visibility of the supporting tenant structure and helps identify potential areas for category rebalancing or expansion in smaller formats.

**Tenants' distribution per category and subcategory per Phase.**

| category | number of tenants |
|---|---|
| Clothing | 132 |
| Food | 38 |
| Shoes | 33 |
| Jewelry & clocks | 20 |
| Children goods | 20 |
| Other retail | 19 |
| Home appliances | 14 |
| Sporting goods | 14 |
| Beauty sector | 11 |
| Services | 10 |
| Entertainment | 7 |
| Home accessories | 7 |
| Anchors | 4 |

At the core of MEGA's success lies its carefully curated tenant mix — a diverse ecosystem of **329 stores among 13 categories** that together create a complete family shopping and entertainment destination.

**Fashion reigns supreme with 132 tenants**, Clothing is the undisputed leader, accounting for over **40%** of all stores. This massive fashion cluster — from fast-fashion giants like Zara and H&M to more premium brands like Meucci, Lady and Gentlemen city — acts as the primary magnet, drawing visitors into the center and generating the highest traffic and sales volume.

Food follows as a strong second pillar **Food & Beverage** comes in second with **38 tenants** — a healthy mix of quick-service restaurants, cafés, and fast-food chains (McDonald's and others). This category plays a critical role in extending dwell time: once

families are in the center, they stay longer to eat, boosting overall spend**. Shoes and Jewelry** complete the fashion picture Shoes (**33 tenants**) and **Jewelry & Clocks** (**20 tenants**) reinforce the fashion dominance, offering specialized shopping experiences that complement the main clothing offerings.

Family and lifestyle categories create balance **Children Goods** (**20 tenants**) and **Home Appliances/Sporting Goods (both 14 tenants)** clearly target families — a core audience for MEGA's "family shopping center" concept. These categories ensure that parents and kids find everything they need in one place.

Specialty and service zones add depth **Beauty Sector (11 tenants), Services (10 tenants), Entertainment (7 tenants), and Home Accessories (7 tenants)** provide additional lifestyle appeal — from pampering and quick fixes to leisure and home inspiration.

**Anchors** as the foundation presented **4** anchor tenants — massive traffic drivers like IKEA, Auchan, OBI, and Stockmann and **5 sub anchors** MediaMarkt, Cosmik, Decathlon, M-Video, Kinostar cinema included in home appliances and entertainment categories form the structural backbone of the center. Even though few in number, they generate the majority of footfall and set the tone for the entire experience.

Key takeaway MEGA's tenant mix is deliberately fashion-heavy (Clothing + Shoes + Jewelry ≈ 60% of tenants), with strong support from food and family categories. This combination creates a powerful formula: fashion attracts, food keeps people longer, anchors drive massive traffic, and lifestyle zones add emotional connection. The result? A highly balanced, high-performing super-regional family destination.



Tenant Count and Category Mix: Phase 1 vs Phase 2.

The bar chart illustrates the distribution of tenants across categories for the two main construction phases of MEGA Belaya Dacha: **Phase 1 (green) and Phase 2 (red).**

**Clothing** remains the dominant category in both phases, accounting for **87 tenants in Phase 1** (the largest group) and **45 tenants in Phase 2**. This confirms **Fashion as the core driver of the shopping center's tenant mix and visitor traffic.**

**Phase 2** shows a noticeable diversification:

- **Food & Beverage** significantly increased (**from 12 to 26 tenants**), strengthening the food court offering and likely improving dwell time.

- **Children Goods, Sporting Goods, and Home Appliances** each grew to **14 tenants**, indicating a stronger focus on family-oriented and home-related categories.

- **Entertainment (5 tenants) in Phase 2:** Bringing Fun and Longer Stays in MEGA.

Smaller categories such as Anchors (3 in Phase 1 → 1 in Phase 2) remained relatively stable, suggesting that major traffic anchors were prioritized in the first phase, while Phase 2 expanded the retail and lifestyle mix.

Overall, the chart highlights a strategic evolution: **Phase 1 focused on establishing a strong fashion and anchor base**, while **Phase 2 enriched the center with more food, family, and home categories** to create a more balanced and attractive tenant mix for families.

This shift likely contributed to improved overall performance and visitor experience in the post-crisis recovery period.



**Leased Area and number of tenants Breakdown by Subcategory – Phase 1.**
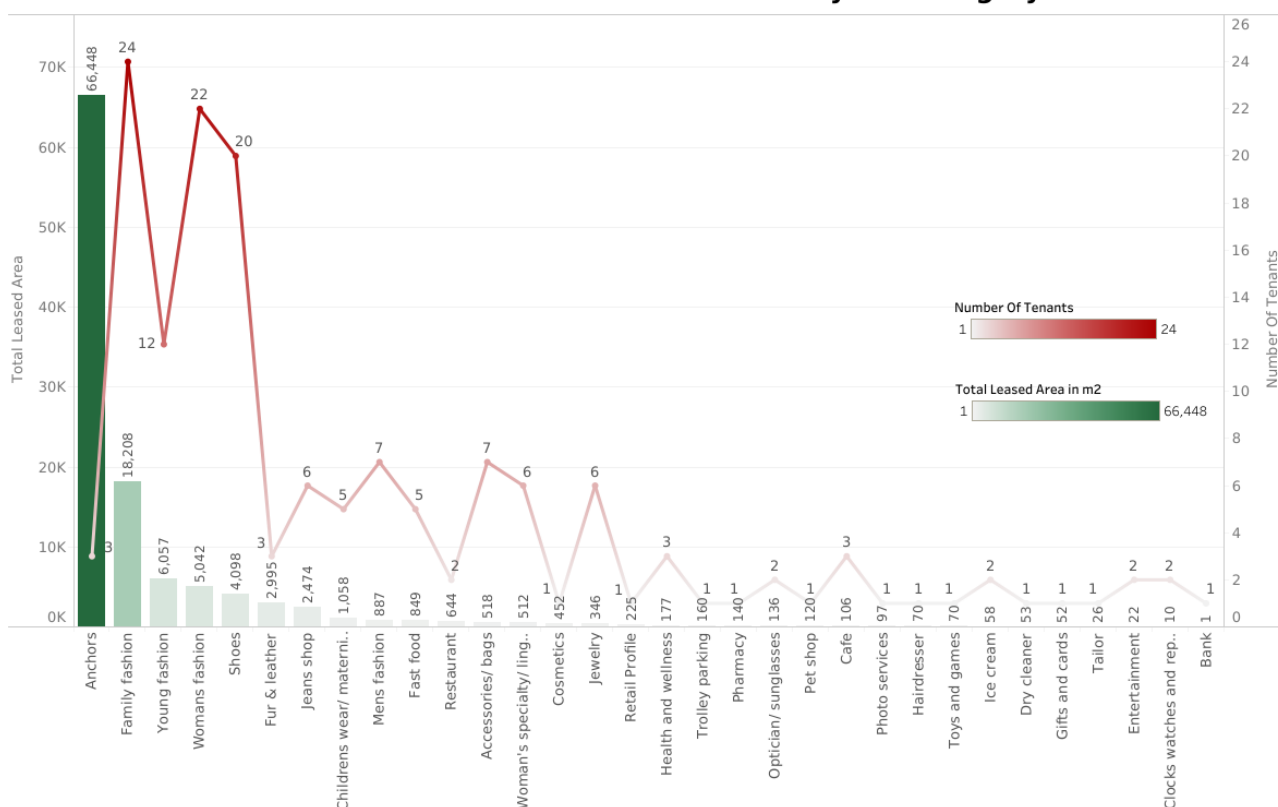
The bar chart illustrates the distribution of **total leased area** across subcategories in Phase 1 of MEGA Belaya Dacha (opened in December 2006).

The chart highlights the strategic dominance of **anchor tenants**, who occupy the largest share of GLA:

- **Anchors** lead with **66,448 m²** (this subcategory includes 3 anchors: IKEA, Auchan, Stockmann), accounting for the vast majority of the leasable space and serving as the primary traffic drivers.

Other significant subcategories include:

- **Family Fashion** (~18,208 m²) — the largest non-anchor group, emphasizing MEGA's focus on family-oriented clothing.

- **Young Fashion** and **Women's Fashion** (~6,057 m² and ~5,042 m² respectively) — reinforcing the center's strong fashion positioning.

- **Shoes** (~4,097 m²) and **Jeans Shop** (~2,473 m²) — supporting the fashion ecosystem.

Smaller subcategories such as **Children's Wear**, **Accessories**, and **Cosmetics** occupy relatively modest areas, reflecting a deliberate focus on large-format anchors and broad fashion appeal in the initial phase.

**Key Insight**: Phase 1 was clearly designed around **high-impact anchors** and a dominant fashion cluster to establish strong visitor traffic and brand recognition from the very beginning. This foundation enabled the center to perform robustly even during the post-2008 crisis recovery.



Leased Area and number of tenants Breakdown by Subcategory – Phase 2.
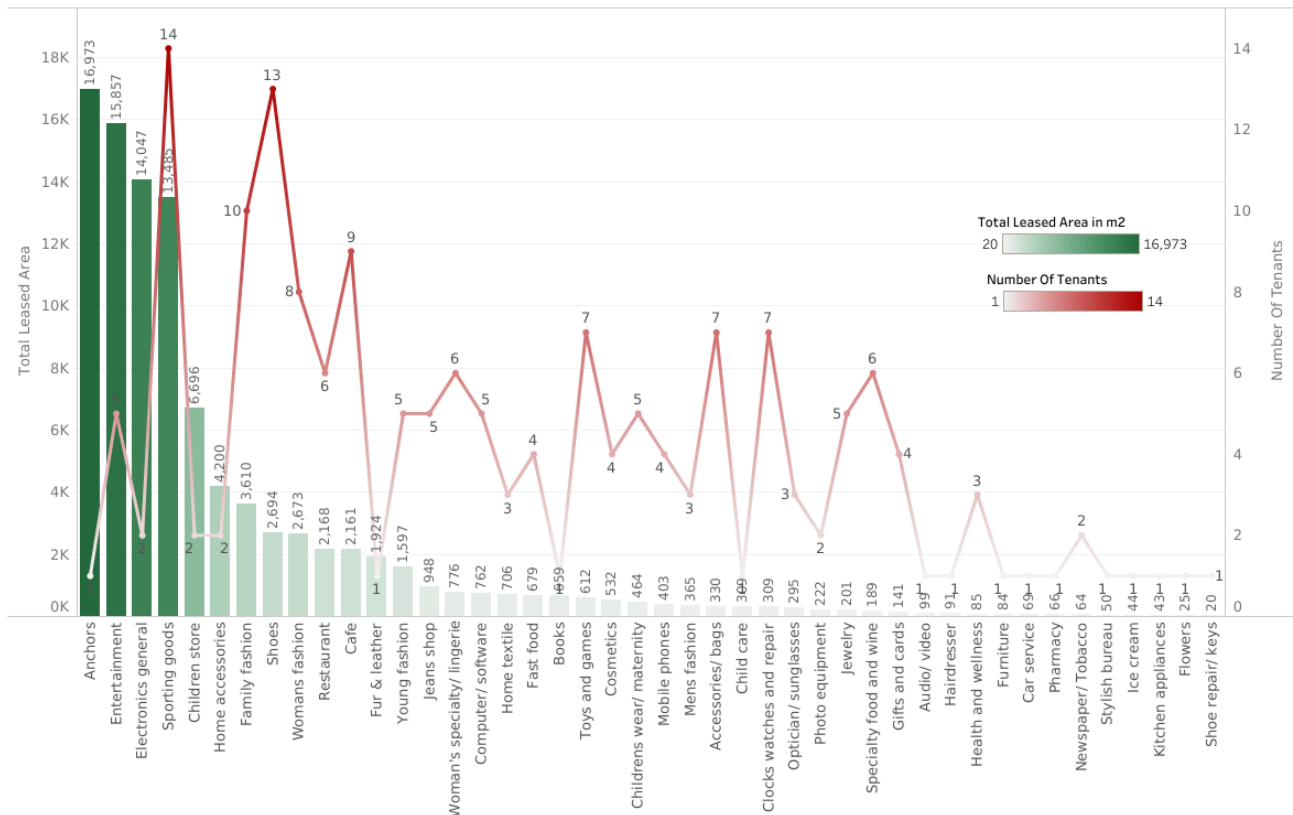
Compared to Phase 1, Phase 2 demonstrates a clear strategic shift toward **diversification and family/lifestyle focus**:

- **Anchors** remain the largest single group with **16,973 m²** corresponded to the main anchor in the phase - OBI, maintaining its role as major traffic driver.

- **Entertainment** grows significantly to **15,857 m²**, including expanded leisure options (Kinostar cinema, Cosmic bowling, Detskoye vremya, Ice Symphony skating rink, Transforse 3D), reinforcing MEGA's family-oriented concept and increasing dwell time.

- **Electronics general** occupies **14,047 m²** represented by 2 main stores Media Markt and M-Video strengthening the technology and home entertainment offering.

- **Sporting goods** (**13,485 m²**) and **Children store** (**6,696 m²**) further emphasize family and active lifestyle categories, aligning with the center's target audience.

- **Food-related subcategories** (Restaurants, Cafés, Fast food) collectively take **~4,200 m²**, enhancing the food court and supporting longer visits.

Smaller subcategories, such as **Jewelry**, **Cosmetics**, **Accessories**, and **Specialty food**, occupy modest spaces, reflecting a balanced approach that prioritizes high-impact anchors and family zones over niche retail.

**Key Insight**: Phase 2 significantly expanded **family-oriented and leisure categories** (Entertainment, Sporting goods, Children), while maintaining anchor dominance. This evolution transformed MEGA from a primarily fashion-

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driven center into a true all-day family destination, contributing to higher dwell time, increased spend, and stronger post-crisis resilience.

**Total tenants' quantity in operation during the period of analysis FY 2010-2011**

During the analysis period (FY 2010–2011), the shopping center demonstrated a clear and consistent improvement in operational efficiency, driven by a strong reduction in vacant leased area and a steady increase in the number of active tenants.

Vacant GLA and Zero-Revenue Tenants Over Time (Sep 2009 – Aug 2011).
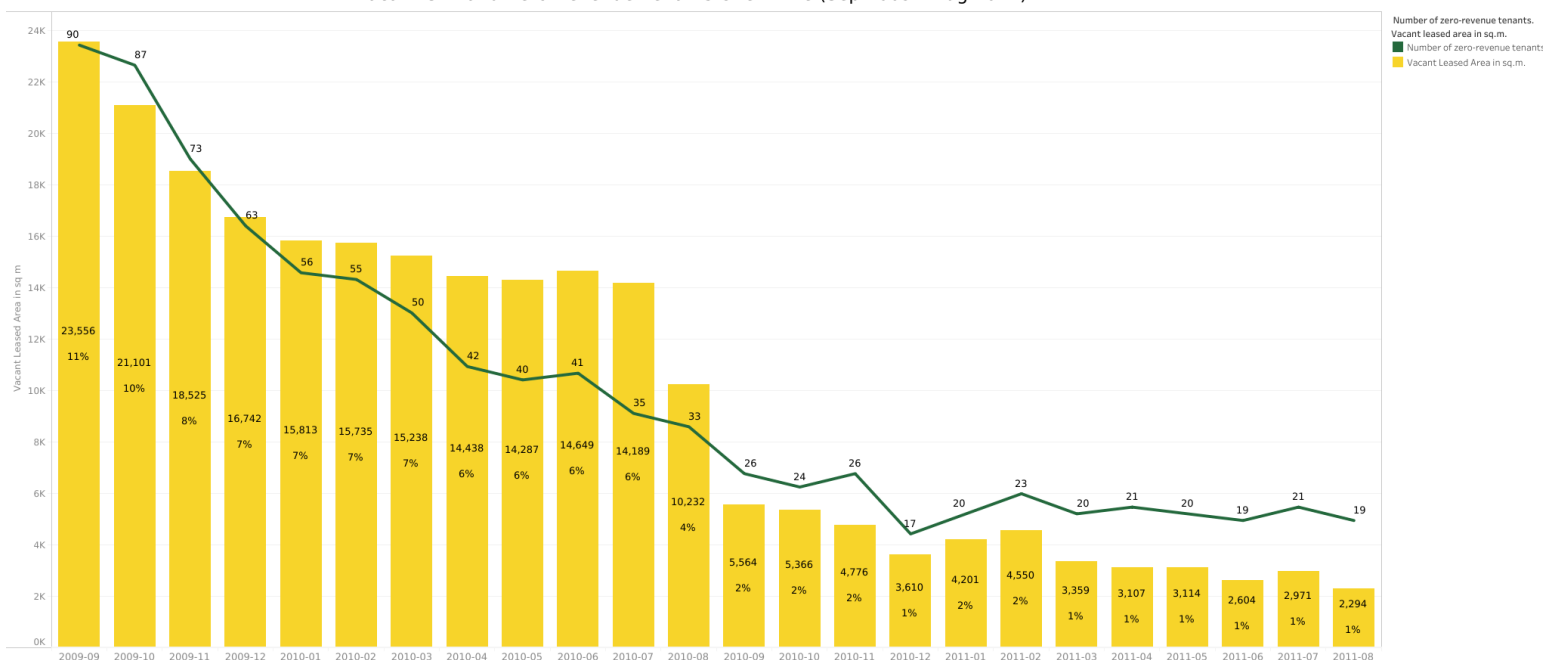


**Total tenants in operation.**

The average number of operating tenants grew from **274 in FY 2010** to **308 in FY 2011** — a **12.4% increase**, reflecting successful tenant attraction and retention efforts, particularly in Phase 2 expansion.

**Vacant leased area dynamics** Vacancy percentage showed a significant decline:

- FY 2010: average vacancy **7.73%**
- FY 2011: average vacancy **1.81%** (a **76.6% reduction** year-over-year)

    This sharp decrease in vacant GLA indicates improved space utilization, higher occupancy rates, and stronger overall center performance post-crisis.

**Key takeaway:** The shopping center exhibited stable and positive business growth, with a clear trend toward full occupancy and increased operational efficiency. The reduction in vacancy combined with the rise in active tenants confirms successful recovery and effective tenant mix management during FY 2010–2011. This positive momentum supports continued focus on maintaining high occupancy and maximizing revenue potential in the long term.

**Total leased area occupied by tenants during FY 2010 and FY 2011.**

| total GLA | Average leased area 2010 | Average leased area 2011 |
|---|---|---|
| 209834 | 193625 | 206041 |

The shopping center's total gross leasable area (GLA) remained fixed at **209,834 m²** throughout the period.

- **FY 2010**: Average leased area stood at **193,625 m²** (≈92.3% occupancy)

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- **FY 2011**: Average leased area increased to **206,041 m²** (≈98.2% occupancy)

This represents a **+12,416 m² (+6.4%)** growth in occupied space year-over-year, reflecting successful tenant attraction, Phase 2 stabilization, and strong post-crisis recovery. The significant reduction in vacancy demonstrates improved operational efficiency and rising center attractiveness during FY 2011.
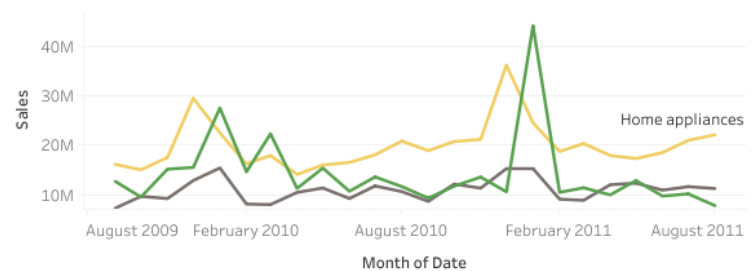
# 7.3. Time – series Trends.

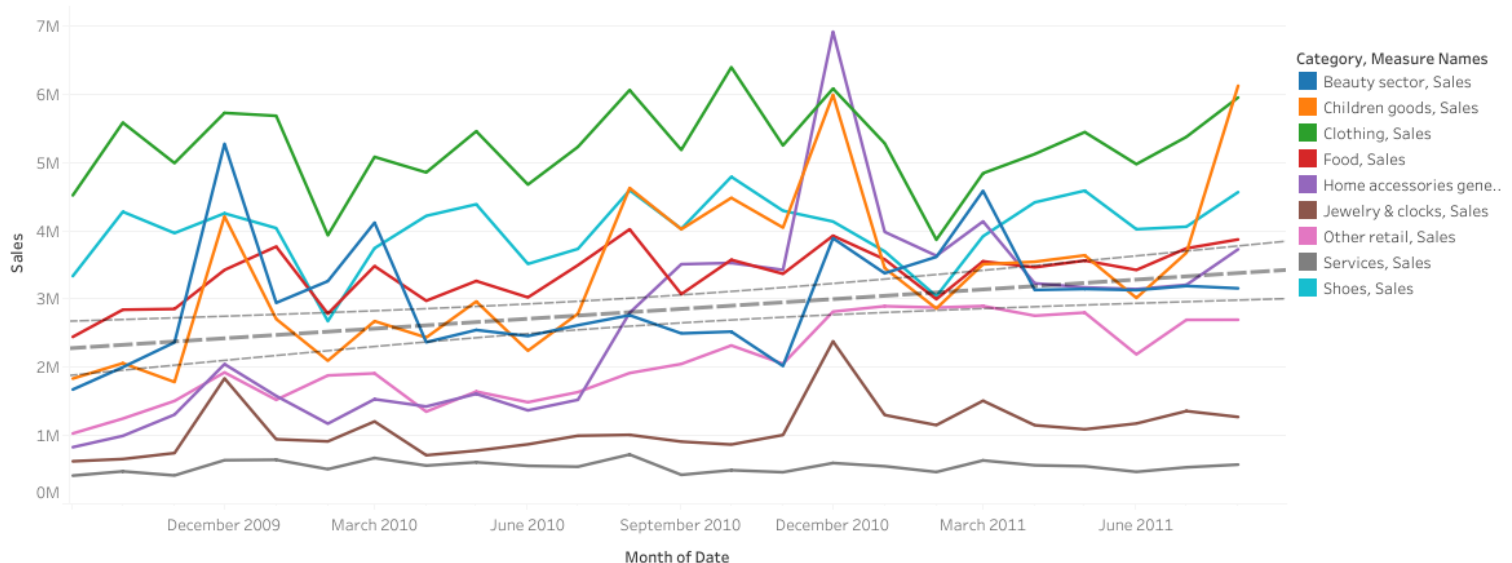**Monthly sales trends and seasonal patterns AVERAGE SALES**



Average monthly sales Anchors sep 2009 - aug 2011.



Average monthly sales Entertainment, Home Appliances, Sporting goods categotries sep 2009 - aug 2011.



Average monthly sales Other Categories sep 2009 - aug 2011.

The line chart Average monthly sales Anchors illustrate the monthly sales dynamics for anchor tenants in the shopping center from September 2009 to August 2011, with a trend line representing the average sales performance over the period.

Key observations:

- Sales exhibit a clear seasonal pattern, with prominent peaks in December 2009 (~448M) and December 2010 (~390M), likely driven by holiday shopping, year-end promotions, and increased consumer spending during festive periods. These spikes could be attributed to higher footfall from seasonal events, gift-buying, and end-of-year bonuses boosting disposable income.

- Notable dips occur in February 2010 (~305M) and February 2011 (~343M), possibly due to post-holiday slowdowns, reduced consumer activity after New Year spending, and typical winter weather impacting traffic in Russia. Similarly, mid-year declines in June 2010 (~354M) and June 2011 (~335M) may stem from summer vacation seasons, when shoppers prioritize travel over retail visits, leading to lower dwell time and impulse purchases.

- Overall, the trend line shows a moderate upward trajectory, indicating stable growth in average sales amid post-2008 crisis recovery. Sales in 2011 generally outperform 2010 equivalents (e.g., April 2011 at ~374M vs April 2010 at ~356M), potentially reflecting economic stabilization, Phase 2 expansion effects, and improved tenant mix efficiency.

- Fluctuations around the trend line suggest external influences, such as macroeconomic factors (e.g., ruble volatility or consumer confidence) or internal events (e.g., marketing campaigns or store renovations), which could explain deviations like the sharp rise in March 2010 (~355M) or the steady climb in late 2011.

This pattern underscores the importance of seasonal strategies for anchors, such as targeted promotions during low periods to mitigate dips, while leveraging holiday peaks for maximum revenue. The positive trend signals resilience and potential for further optimization in tenant performance.

### Average Monthly Sales Trends: Entertainment, Home Appliances, and Sporting Goods (Sep 2009 – Aug 2011)

This line chart presents the average monthly sales performance for three key non-anchor categories — Entertainment (green), Home Appliances (yellow), and Sporting Goods (grey) — from September 2009 to August 2011. These categories were analyzed separately due to their significantly higher sales volumes compared to most other non-anchor segments, making them important contributors to overall center traffic and revenue after Anchors.

### Key observations:

- **Clear seasonal pattern** is visible across all three categories, with consistently lower demand in the spring–summer period (April–September) and markedly higher activity during the winter season (October–March). This reflects typical consumer behavior in Russia: reduced retail visits during warm months due to vacations, outdoor activities, and seasonal shifts, followed by strong activation in autumn–winter driven by holiday preparations, back-to-school, colder weather, and year-end spending.

- **December peaks** are the most prominent feature in every year — especially noticeable in Home Appliances and Entertainment — likely due to pre-New Year gift purchases, electronics promotions, and family-oriented entertainment spending. Sporting Goods shows a slightly flatter but still elevated winter curve, probably tied to winter sports equipment demand.

- **January 2011 spike in Entertainment** stands out as the highest single monthly point on the chart (~44M), significantly outperforming the January 2010 level. This sharp increase could be explained by several factors:
  - o   Post-holiday momentum (carry-over from December promotions)
  - o   Possible new openings or expansions in cinemas, bowling, or family entertainment venues during late 2010 / early 2011
  - o   Improved consumer confidence or targeted winter marketing campaigns in Phase 2
  - o   Weather-related indoor entertainment preference during cold January

- **Overall trend** across the three categories remains relatively stable with moderate upward movement in 2011 compared to 2010, especially visible in Home Appliances (yellow line) and Sporting Goods (grey line). This indicates gradual recovery and stabilization after the 2008–2009 crisis, supported by Phase 2 development and growing consumer spending power.

**Conclusion:** The chart confirms strong seasonality in non-anchor categories, with winter months (especially October–January) driving the majority of sales volume. The exceptional January 2011 peak in Entertainment highlights the potential impact of new tenant openings, marketing efforts, or favorable external conditions. These three categories remain critical traffic and revenue generators after Anchors — their performance is closely tied to seasonal consumer habits and should be supported with targeted winter activation strategies to maximize annual results.

## Average Monthly Sales Trends – Other Categories (Sep 2009 – Aug 2011)

The line chart displays the average monthly sales performance for non-anchor categories (excluding Anchors, Entertainment, Home Appliances, and Sporting Goods) from September 2009 to August 2011. These categories represent the supporting tenant mix of the shopping center.

**Key observations:**

- **Clothing** and **Shoes** are the primary drivers among the displayed categories, consistently showing the highest average monthly sales volumes throughout the period. This reflects their central role in driving fashion-related footfall and repeat visits.

- **Children Goods** and **Beauty Sector** also maintain relatively strong and stable performance, ranking just below Clothing and Shoes in average monthly sales.

- **Food** demonstrates highly consistent sales, remaining in the range of **3–3.5 million RUB** per month across the entire period with minimal fluctuations. This stability highlights the category's role as an everyday necessity anchor within the center.

- **Home Accessories** shows a very pronounced spike in December (typical for gift and home-related holiday purchases) and a clear step-up in performance in 2011. Average monthly sales roughly doubled from ~1.5 million RUB in 2010 to ~3 million RUB in 2011, indicating successful tenant expansion, improved merchandising, or stronger consumer demand for home-related goods post-crisis.

- **Jewelry & Clocks** maintains an average of around **1 million RUB** per month, with noticeable December peaks in both years (**1.8 million RUB** in 2010 and **2.3 million RUB** in 2011), consistent with seasonal gift-buying behavior.

- **Other Retail** exhibits a clear upward trend in average monthly sales in 2011 compared to 2010. The trend line slopes positively, signaling gradual positive dynamics and likely the result of new openings, category refresh, or improved tenant performance.

- **Services** shows stable but modest results, averaging around **500,000 RUB** per month throughout the period. As a supporting rather than primary category, its role is complementary — it benefits from the traffic generated by fashion, food, and entertainment anchors.

**Conclusion** The overall trend across these supporting categories is positive: average monthly sales in 2011 are generally higher than in 2010, particularly in Home Accessories, Other Retail, and Jewelry & Clocks. This upward movement reflects successful post-crisis recovery, stabilization of consumer spending, and the positive impact of Phase 2 development and tenant mix optimization. The center continues to benefit from a balanced supporting tenant structure that generates consistent traffic and revenue alongside the anchor and high-volume categories.

## Year-over-Year Sales Performance by Category (FY 2010 vs FY 2011) / sales dynamics
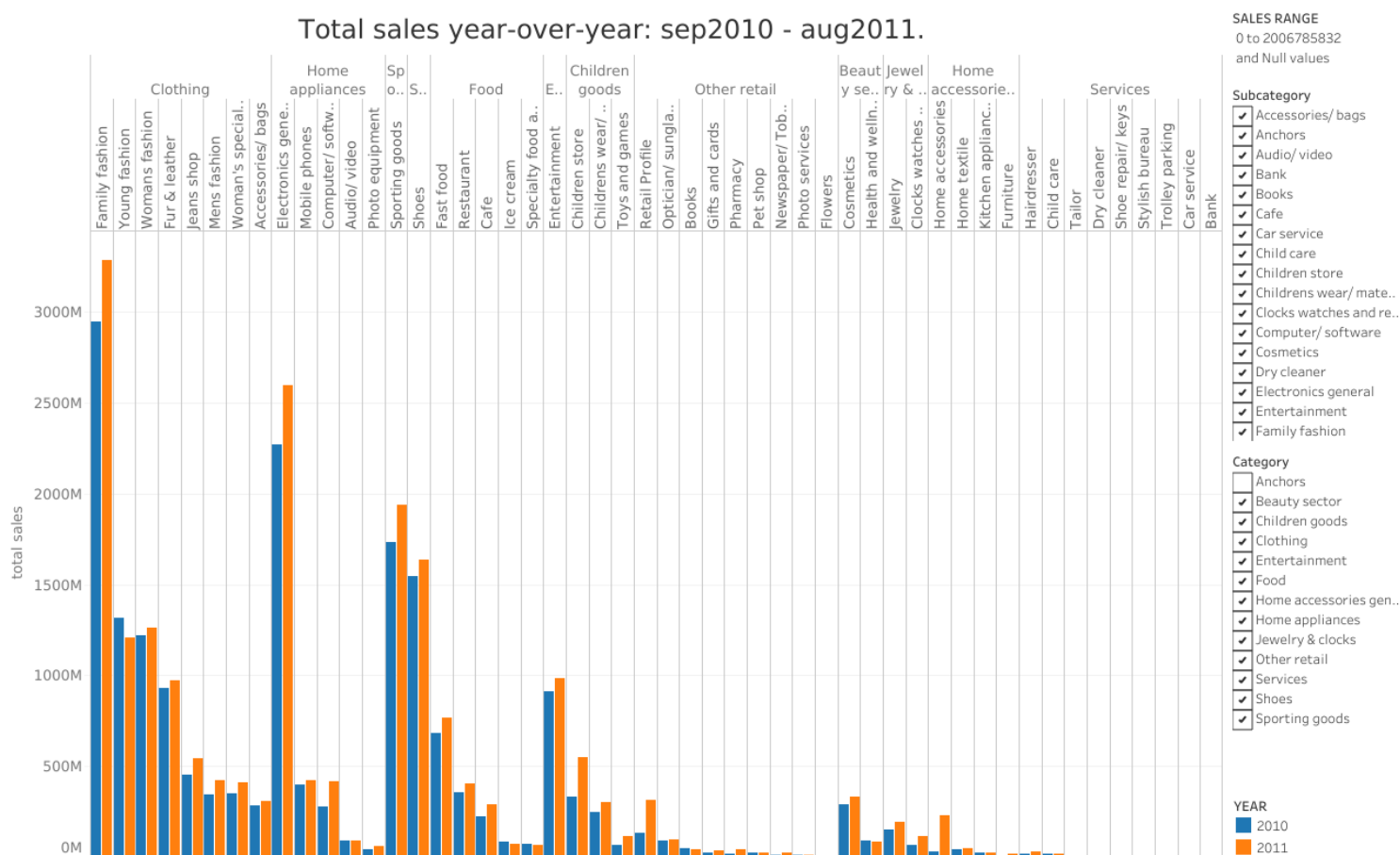


The bar chart presents total annual sales by business category for FY 2010 and FY 2011, with the year-over-year comparison clearly showing growth or decline across the shopping center's tenant mix. Anchor tenants were excluded as their results are higher than other categories.



Year-over-Year Sales Performance by Category (% Change).

| Category | 2010 | 2011 |
|---|---|---|
| Anchors | 22.89% | 25.66% |
| Clothing | 10.32% | 11.06% |
| Home appliances | 4.05% | 4.73% |
| Sporting goods | 2.28% | 2.55% |
| Shoes | 2.03% | 2.15% |
| Food | 1.87% | 2.11% |
| Entertainment | 1.20% | 1.30% |
| Children goods | 0.85% | 1.27% |
| Other retail | 0.48% | 0.77% |
| Beauty sector | 0.50% | 0.55% |
| Jewelry & clocks | 0.28% | 0.40% |
| Home accessories general | 0.14% | 0.42% |
| Services | 0.06% | 0.08% |
| Grand Total | 46.95% | 53.05% |

The table presents the share of total center sales by business category for FY 2010 and FY 2011, clearly showing year-over-year changes in contribution to overall turnover.

**Key observations:**

- **Anchors** remain the dominant contributor, increasing their share from 22.89% in FY 2010 to 25.66% in FY 2011 — the largest absolute and relative gain among all categories. Anchors continue to drive the majority of center revenue.

- **Clothing** strengthened its position as the leading non-anchor category, growing from 10.32% to 11.06%.

- **Home Appliances** showed one of the most dynamic increases, rising from 4.05% to 4.73%.

- **Sporting Goods** improved from 2.28% to 2.55%, supported by large-format players.

- **Shoes** increased slightly from 2.03% to 2.15%.

- **Food** posted steady growth from 1.87% to 2.11%, maintaining consistent performance as an everyday necessity category.

- **Entertainment** grew from 1.20% to 1.30%.

- **Children Goods** demonstrated one of the strongest relative increases, rising from 0.85% to 1.27% — likely driven by new brand entries and family-oriented demand.

- **Other Retail** showed significant improvement, increasing from 0.48% to 0.77%, reflecting positive dynamics in this diverse group.

- **Beauty Sector** grew modestly from 0.50% to 0.55%.

- **Jewelry & Clocks** increased from 0.28% to 0.40%.

- **Home Accessories General** rose sharply from 0.14% to 0.42%, one of the highest relative growth rates.

- **Services** improved from 0.06% to 0.08%, though remaining a supporting category.

**Overall center performance**: The total share of sales across all categories increased from 46.95% in FY 2010 to 53.05% in FY 2011 — a positive shift of +6.1 percentage points. The broad-based growth across nearly all categories indicates successful post-crisis recovery, improved tenant mix, Phase 2 stabilization, and rising consumer spending power during the period. This upward trend across the board confirms the shopping center's strengthening market position and operational efficiency.


## Monthly Sales Dynamics: Anchor Tenants (Sep 2009 – Aug 2011)

Anchors remain the primary revenue and traffic drivers, with Auchan consistently generating the highest sales volumes and displaying clear seasonal peaks.

Key observations:

- **AUCHAN** is the undisputed leader among anchors, producing the highest monthly sales throughout the period. The line shows pronounced seasonal spikes every December, reflecting strong year-end consumer spending, holiday promotions, gift purchases, and increased food & household demand typical for hypermarkets during festive periods.

- **IKEA,** the second-largest contributor, demonstrates a relatively stable sales curve with moderate seasonal variation. As a unique and well-known brand present only in MEGA shopping centers, IKEA benefits from strong brand loyalty and destination traffic, maintaining consistent performance even during lower seasons.

- **OBI** (DIY/Home Improvement) exhibits distinct seasonal behavior, with clear peaks in May each year — directly linked to the start of the dacha (summer house) season and home renovation activity in Russia. These spring–early summer spikes help offset the typical retail slowdowns observed in other categories during warmer months, effectively balancing traffic and sales across the center.

- **STOCKMANN** shows two regular peaks: one in April and another in October. These correspond to the well-known CRAZY DAYS IN STOCKMANN promotional campaigns, which drive significant additional footfall to the shopping center and create short-term sales surges.

**Overall dynamics:** The anchor segment displays pronounced seasonality, with December consistently the strongest month due to holiday-related consumption. The presence of Auchan and IKEA provides year-round stability, while OBI and Stockmann add targeted seasonal boosts that help smooth out quieter periods (especially spring–summer). This complementary mix of anchors strengthens the center's overall resilience and traffic generation capability.

The data confirms the critical role of anchors in driving the majority of sales and visitor flow, with each major tenant contributing unique seasonal strengths that together create a balanced performance profile across the year.

## Monthly Sales Dynamics: Sub-Anchors Category (Sep 2009 – Aug 2011)

This group plays a crucial role in traffic generation and center revenue after the main Anchors.

Key observations:

- **MediaMarkt** (German electronics retailer) is the clear leader within the Sub-Anchors group, consistently showing the highest monthly sales volumes. The line exhibits strong seasonality, with pronounced peaks during holiday periods (especially December) and back-to-school / pre-New Year promotions. MediaMarkt benefits from heavy TV advertising, frequent promotional campaigns, and broad consumer appeal for electronics and household appliances.

- **M-Video** (another major electronics chain) and Decathlon (sporting goods) form a solid foundation for the category, delivering stable and significant contributions throughout the period. Both brands maintain reliable performance with moderate seasonal variation, supporting consistent traffic and cross-shopping in the center.

- **Kinostar cinema** stands out with a remarkable spike in January 2011, recording the highest single-month sales in the entire Sub-Anchors group. This likely reflects successful post-holiday programming, new blockbuster releases, or promotional pricing that drove exceptional attendance and additional F&B/revenue streams during the winter season.

- **Cosmik** (entertainment center) demonstrates the weakest performance in the group, with noticeably lower average monthly sales and relatively flat seasonal peaks. Even during traditionally strong months (December, January), Cosmik's sales show only modest increases compared to other Sub-Anchors. This pattern suggests insufficient marketing support, limited promotional activity, or lack of strong consumer pull — resulting in weaker ability to attract visitors and drive dwell time.

Conclusion The Sub-Anchors category is dominated by strong, well-promoted brands (MediaMarkt, M.Video, Decathlon) that ensure stable high sales and traffic generation. Kinostar's exceptional January 2011 performance highlights the potential of entertainment tenants when properly supported. However, Cosmik's consistently low and flat results raise concerns within the tenant mix — the lack of significant seasonal peaks and overall underperformance compared to peers indicate that this tenant may require enhanced marketing efforts, more aggressive promotions, and/or operational improvements to increase visitor attraction and revenue contribution. Without intervention, Cosmik risks remaining a weak link in this otherwise strong Sub-Anchors group.

## Sales Performance in Clothing Category (1,000–5,000 m² premises) – FY 2010–2011

The analysis focuses on the Clothing category in the large-format segment (1,000–5,000 m²), which plays a key role in the fashion direction of Phase 1.

**Main leaders by sales volume:**

- H&M, ZARA, Lady & Gentlemen City, and Snezhnaya Koroleva consistently demonstrate the highest sales results in this size band. These brands form the core of the category's performance, generating stable and significant revenue thanks to strong brand recognition, wide assortment, and effective pricing strategies that attract a broad customer base.

**Negative trend:**

- Topshop shows a clear negative tendency over the period. Sales volumes are declining steadily, indicating weakening competitiveness, possibly due to changing consumer preferences, insufficient assortment updates, or stronger competition from fast-fashion leaders.

**Lowest performers:**

- BHS exhibits the weakest results in the group, with consistently low sales figures.

- Ann Christine and especially Cult also rank at the bottom. Cult operated for a very short period and eventually closed, which further highlights the challenges faced by smaller or less adapted brands in this competitive size segment.

**Overall conclusion**: The 1,000–5,000 m² Clothing segment is dominated by globally recognized fast-fashion and mid-market leaders (H&M, ZARA, Lady & Gentlemen City, Snezhnaya Koroleva), which maintain strong positions. At the same time, weaker brands such as Topshop, BHS, Ann Christine, and Cult show signs of struggle or failure, underscoring the high level of competition and the importance of strong brand equity, assortment relevance, and operational efficiency in this size range.

**Clothing Category**

- In the **500–1,000 m²** segment, all tenants demonstrate strong sales results. The top performers are **Bershka** and **Ostin**, consistently leading the group with the highest volumes.

- In the **250–500 m²** segment, **Stradivarius** and **Mango** stand out as the strongest players, delivering the best sales figures. In contrast, **Castro** shows the weakest performance in this size band.

- In the **100–250 m²** segment, **Bliss** raises concerns due to very low sales results compared to peers.

**Sales Performance by Category and Premises Size Bands (Detailed Breakdown)**

The analysis highlights the performance of key categories across different premises size segments, revealing distinct leaders, stable performers, and tenants facing challenges.

**Home Appliances Category**

- In the **50–100 m²** segment, **Nokia** and **Restore** are the clear leaders, while the entire group shows solid performance with consistent year-over-year growth across all tenants.

- In the **100–250 m²** segment, **ION** emerges as the dominant leader with the highest sales volumes. **FOTOru** and **1C INTERES** lag behind, likely due to the specific nature of their offerings (photo services and video games sales), which generate lower average ticket values compared to broader electronics retailers.

- **Small Premises (<50 m²)** The leader in this segment is **Respublica Igr**, demonstrating the strongest results among small-format tenants.

**Shoes Category**

- In the **50–100 m²** segment, **Salamander** stands out with the highest sales indicators. **El Monte** and **Komfort Shoes** show less comfortable performance, struggling to compete with established brands despite their presence in a major shopping center.

- In the **100–250 m²** segment, **ECCO** is the clear leader, with average monthly sales ranging from **9 to 25 million RUB** across low and high periods. The rest of the group generates significantly lower volumes, typically between **1 and 8 million RUB** per month.

- In the **250–500 m²** segment, **EXCEL** and **Carlo Pazolini** are the top performers. Notably, Carlo Pazolini experienced an atypical sharp decline in July 2011, with sales dropping from **7 million RUB** per month to only **865 thousand RUB**.

## Food Category

- **McDonald's** is the undisputed leader with the highest sales volumes. It is followed by strong performers **Il Patio** and **Rostics**. The weakest performers in the category are **Okean Svezhesti**, **Ekler**, and **Daily Fresh**.

This breakdown underscores the varying levels of success within each category and size segment, with clear leaders driving category performance and several tenants showing signs of underperformance or vulnerability.

## Average sales density per category

**Sales Density** — total sales / total leased area (RUB/m²/year). Key retail performance indicator — measures how efficiently each square meter generates revenue; higher values indicate strong tenant productivity and center attractiveness.
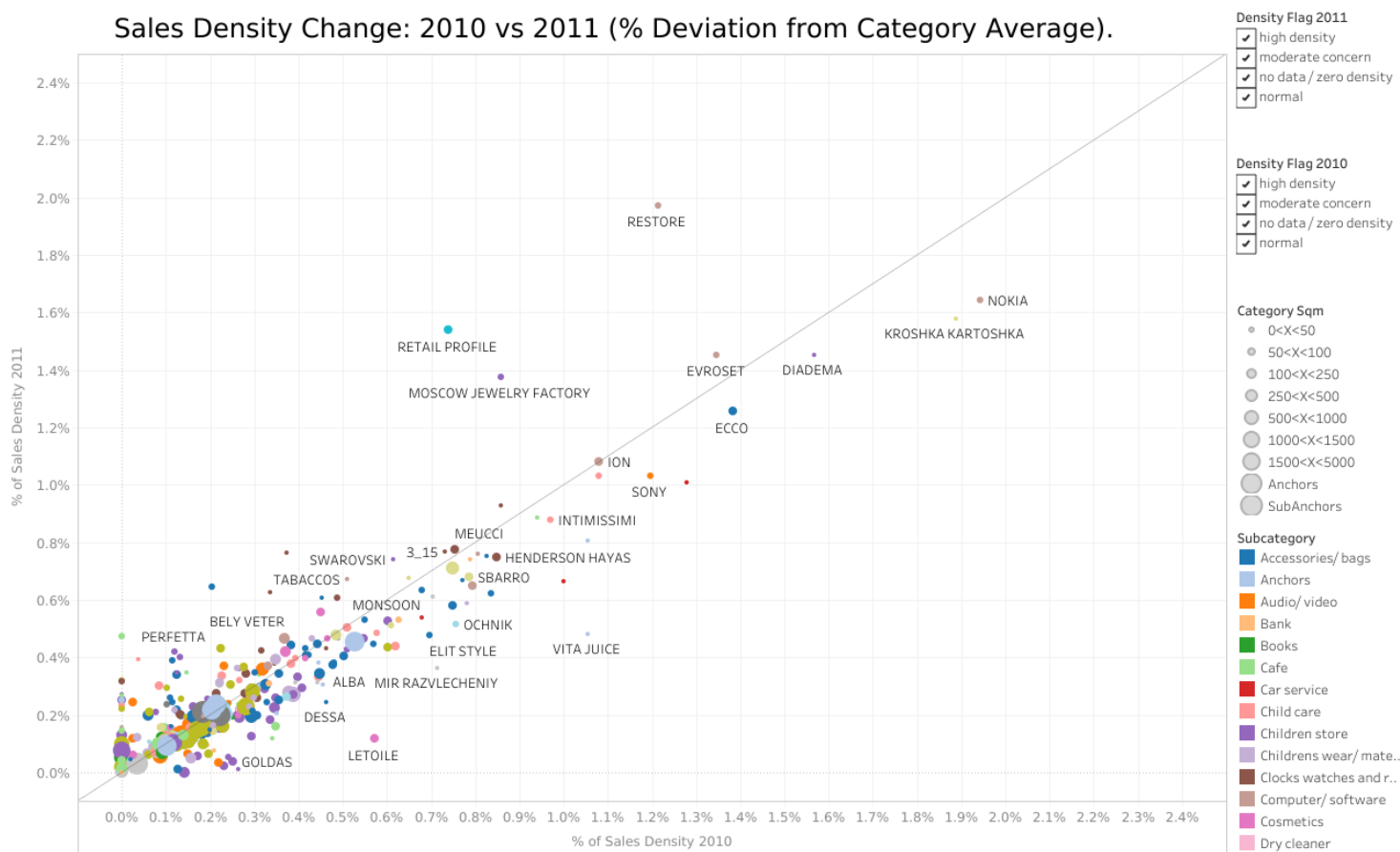


This scatter plot visualizes how individual tenants performed in sales density (RUB per m²) in FY 2010 and FY 2011 compared to the average density of their own category/subcategory group.

- **X-axis**: % deviation from category average density in 2010
- **Y-axis**: % deviation from category average density in 2011
- 100% = exactly at the category average for that year

- 100% = above average (stronger performer)
- <100% = below average (weaker performer)
- The diagonal line (45°) represents "no change" year-over-year: points above the line improved their relative position in 2011 compared to 2010, points below declined.

**Key observations:**

- The majority of tenants cluster around the 80–150% range in both years — most are performing reasonably close to or moderately above their category average.
- A small group of **clear outperformers** is visible in the upper-right quadrant (well above 100% in both years): these tenants consistently deliver significantly higher sales per m² than their peers in the same subcategory and size band. They are the strongest contributors to category performance.
- Several tenants appear in the **lower-left area** (below 100% in both years) — these are systematically underperforming relative to their category benchmark. They represent the main area of concern in the tenant mix.
- A noticeable number of points lie **above the diagonal** — these tenants improved their relative efficiency in 2011 compared to 2010 (moved from below-average to closer to or above average, or widened their lead).
- Conversely, some tenants fell **below the diagonal** — they lost relative position year-over-year (became less efficient compared to the category average).
- Extreme outliers (both positive and negative) are relatively few, which suggests the tenant mix is fairly balanced overall, with only a handful of very strong or very weak performers driving most of the variance.
- The analysis of sales density (RUB per m²) across various categories and size bands reveals several tenants with persistently low performance and a number of brands showing negative year-over-year trends.
- **Tenants with consistently low sales density:**
- **Café Ekler** (Food category) — among the weakest performers in the food segment.
- **Cult** (Clothing) — very low density, ultimately leading to closure after a short period of operation.
- **Estelle a Store** and **Bliss** (Clothing) — both showing significantly below-average results in their size bands.
- **Popcorner** (Accessories category) — notably low density compared to peers.
- **Cosmik** (Entertainment center) — weak overall performance with flat seasonal peaks, indicating limited visitor draw and insufficient marketing support.
- **Obuv 21 Veka** (Shoes) — among the lowest in its segment, struggling to compete with established brands.
- **Tenants with negative year-over-year trend (declining relative density):**
- **Children's Wear** — **Prenatal** shows a clear tendency toward worsening performance.
- **Clothing** — **Ichi**, **Marco Polo**, and **Sinequanone** demonstrate declining relative density compared to their category average.
- **Jewelry** — **Pilgrim Store** and **Zen** also exhibit negative dynamics year-over-year.

**Conclusion** The chart reveals a reasonably healthy distribution with a positive tilt: more tenants improved their relative density in 2011 than declined. The presence of consistent outperformers in the upper-right area is a strength of the center, while the cluster of underperformers below 100% highlights the main opportunity for improvement — either through operational support, marketing assistance, assortment refresh, or, in some cases, potential tenant replacement. Overall, the direction of movement (more points above the diagonal) signals gradual positive evolution in tenant efficiency across 2010–2011. Although several tenants across different categories and size segments consistently underperform in sales density, generating significantly lower revenue per m² than their peers. This group includes Café Ekler, Cult, Estelle a Store, Bliss, Popcorner, Cosmik, and Obuv 21 Veka. At the same time, a number of brands are showing a clear negative trend in relative performance: Prenatal (Children's Wear), Ichi, Marco Polo, Sinequanone (Clothing), and Pilgrim Store and Zen (Jewelry). These tenants represent the main areas of concern in the current tenant mix. Their low or declining density may indicate operational challenges, insufficient marketing support, outdated assortment, or overly high occupancy costs relative to their revenue generation capability. Addressing these underperformers — through renegotiation of

terms, marketing assistance, assortment refresh, or potential replacement — could significantly improve overall center efficiency and category strength.

# 7.4. Rent rates analysis (rent_sqm).

Correlation of Average Rent per m² with Premises Size and Business Subcategory



Correlation average rent per m2 per premise sq m category and tenant business subcategory.
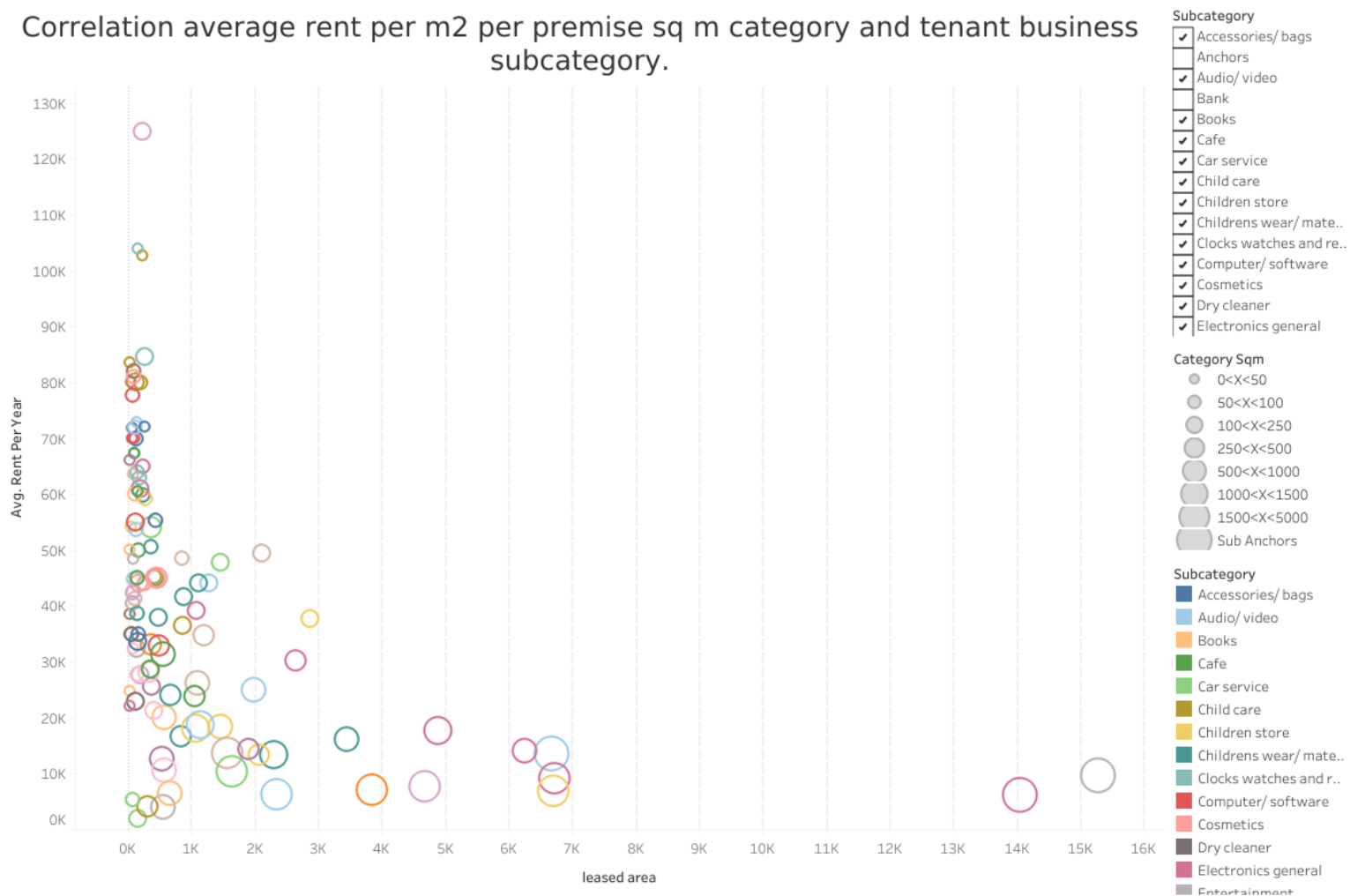
The scatter plot illustrates the relationship between average annual rent rates per square meter (Y-axis) and total leased area (X-axis), segmented by business subcategory (colors) and premises size bands (point sizes). Each point represents a unique combination of subcategory and size band, highlighting how rent pricing varies with scale and business type.

**Key trends and observations:**

- A clear inverse correlation emerges: as leased area increases (moving right on the X-axis), average rent per m² generally decreases (lower Y-axis values). This reflects standard shopping center economics, where larger tenants secure lower unit rents due to their traffic-generating role and bargaining power, while smaller tenants pay premium rates for high-visibility locations.

- **Large premises (e.g., Sub-Anchors, gray points)** occupy the far-right, low-rent area, with average rates per m² at the bottom of the scale. These tenants, often in entertainment or home improvement, benefit from the lowest rents relative to their substantial footprints, emphasizing their strategic value in anchoring the center.

- **Mid-sized premises (100–1,500 m², medium point sizes)** show moderate rent levels and a broader scatter. Categories like clothing (orange/brown points), shoes (purple), and sporting goods (dark green) cluster in this range, with rents varying based on brand strength and location — stronger brands tend to negotiate slightly lower rates.

- **Small premises (<100 m², smallest points)** dominate the upper-left quadrant, with the highest average rent rates per m². Subcategories such as car service (green), cafe (light green), clocks/watches (cyan), and dry cleaner (pink) exhibit the most elevated rents, driven by high footfall zones and impulse-oriented business models that justify premium pricing despite limited space.

- Overall, the plot confirms a negative trend line (implied by the point distribution): rent rates drop sharply as area exceeds ~1–2k m², stabilizing at very low levels for the largest tenants. Subcategories with smaller average areas (left side) show greater rent variability, indicating more aggressive pricing for compact, high-margin operations.

This visualization underscores the center's tiered rent strategy: rewarding large-scale tenants with favorable rates to ensure long-term presence, while extracting higher unit rents from small-format, specialty operators. The wide dispersion in smaller segments highlights opportunities for targeted negotiations or repositioning to optimize revenue without compromising tenant viability.

**Key observations:**

- **Large-format premises (1,000–5,000 m² and above)** generally show the lowest rent rates per m². Anchor and sub-anchor tenants (including major electronics and home improvement players) benefit from significantly lower rents per square meter compared to smaller formats, reflecting their role as traffic generators and long-term commitments.

- **Mid-sized premises (100–1,000 m²)** exhibit moderate to higher rent levels. Fashion, shoes, jewelry, and specialty retail tenants in these bands pay notably more per m², with some subcategories (e.g., women's fashion, jewelry, and fast fashion) showing the widest rent ranges and the highest upper limits.

- **Small premises (<100 m²)**, including kiosks, cafes, fast food, and specialty services, command the highest rent rates per m². Categories like fast food, ice cream, cosmetics, jewelry shops, and small-format cafes consistently appear at the top of the rent spectrum, driven by high footfall locations and impulse-driven business models.

- Within the same size band, rent variability is substantial across subcategories. Fashion-related tenants (especially in women's and young fashion) often face the highest maximum rents, while entertainment, home accessories, and certain food operators show more moderate ranges.

## Top 10 Rent Payers: Highest Rates per m²

The table highlights the tenants with the highest rent rates per square meter in the shopping center. These are predominantly small- and mid-sized operators in premium or high-visibility locations, where landlords charge significantly elevated rates due to footfall potential, brand prestige, and impulse-driven business models.

**Key observations:**

- The most expensive rents per m² are paid by **small-format jewelry & clocks** tenants (e.g., MASTER MINUTKA, PILGRIM, DIADEMA), which typically occupy compact spaces in high-traffic zones. These brands benefit from premium positioning but face high occupancy costs relative to their footprint.

- **TRUST Services** stands out with the highest rate in the list — a small service-oriented tenant paying a very substantial rent per m², likely due to its strategic location and high-margin business model.

- **Other retail** (RETAIL PROFILE) and certain **home appliances** tenants (NOKIA, MTS) also appear among the top payers, reflecting their need for visible, high-traffic spots despite larger premises in some cases.

- **Food & beverage** operators (e.g., VITOMIN) round out the upper tier, where small kiosks and cafes pay premium rents per m² to secure prime spots near entrances or food courts.

**General picture:** The highest rent rates are concentrated in small-format, high-turnover categories (jewelry & clocks, services, select food & retail), where tenants can afford elevated costs thanks to strong footfall and impulse purchases. Larger tenants (anchors, sub-anchors) and mid-sized fashion/home operators typically pay much lower rates per m², benefiting from their traffic-generating role and longer-term commitments.

This pricing structure is typical for shopping centers: premium rents are charged to small, high-margin tenants in prime locations, while larger anchors receive more favorable rates to ensure long-term stability and visitor draw. The wide spread between the top payers and the rest of the tenant mix highlights opportunities for rent optimization and negotiation in the mid- and lower-tier segments.

## Top 10 Minimum Rent Rates per m²: Selected Anchor and Supporting Tenants

The table lists minimum rent rates per square meter for a selection of tenants, primarily anchors and key supporting operators. These figures reflect the lowest negotiated or baseline rates applied to each tenant's premises.

**Key observations:**

- **Anchors** enjoy the most favorable minimum rent rates per m². Major players such as **IKEA**, **AUCHAN**, and **OBI** have the lowest rates in the group, reflecting their critical role in driving footfall, long-term lease commitments, and overall center attractiveness. These large-format tenants typically secure significantly reduced rates per square meter compared to smaller operators.

- **Entertainment** tenants like **KINOSTAR DELUXE** and **ICE SYMPHONY** show moderate minimum rates, positioned higher than anchors but still competitive for their size and traffic-generating potential.

- **Home appliances** and **food** operators (e.g., **EVROSET**, **LAS PALMOS**) fall in the mid-range of minimum rents, balancing their footprint with expected turnover.

- **Services** tenants display the widest variation and some of the highest minimum rates per m² (e.g., **TROLLEY PARKING**, **SMESHARIKI**, **STVARIANT**). Small-format service providers often pay premium rates due to high-visibility locations and limited space requirements.

**General picture** Anchor tenants consistently receive the lowest minimum rent rates per m², underscoring their strategic importance as traffic anchors and long-term stabilizers for the center. Supporting categories (entertainment, food, services) pay noticeably higher minimum rates, with small-format services showing the highest unit costs. This pricing structure aligns with standard shopping center economics: large-scale, high-impact tenants benefit from preferential rates to ensure their presence, while smaller or service-oriented tenants face higher per-m² costs due to location value and operational margins.

The spread in minimum rates highlights the center's balanced approach — rewarding anchors with lower costs while extracting higher unit rents from high-margin or impulse-driven tenants in smaller formats. This pattern supports overall traffic flow and revenue stability.

**Rent Rate Ranges by Subcategory and Premises Size – Key Insights**

| subcategory | Category_sqm | tenant_min_rent | leased_area_min m2 | tenant_max_rent | leased_area_max m2 | total_tenants_in_group | min from max rent % difference | observation |
|---|---|---|---|---|---|---|---|---|
| Accessories/ bags | <50 | ALDO ACCESSORIZE | 43 | LADY COLLECTION | 39 | 7 | 51 | **Accessories/Bags <50 m²**: The rent range shows a 51% difference between min and max rates. Lady Collection, with the highest rate, benefits from a high-traffic zone placement. |
| Accessories/ bags | 50<X<100 | CLAIRES | 77 | SAMSONITE | 72.5 | 6 | 65 | **Accessories/Bags 50–100 m²**: A 65% rent difference is observed. Rates could be considered for adjustment, especially for Samsonite, which specializes in bags and suitcases rather than bijouterie like Claires. |
| Anchors | Anchors | OBI | 16973 | STOCKMANN | 14200.2 | 4 | 70 | **Anchors**: The rent range exhibits a 70% difference. OBI, as a DIY store with the largest leased area and unique scale, has a lower rate, while Stockmann, an upper-middle department store, pays a fairly higher rate. |
| Cafe | <50 | ESPRESSO MANIA | 47.2 | CINNABON | 29.2 | 4 | 46 | **Cafe <50 m²**: A 46% rent difference. The rate is fair for Cinnabon, which lacks sitting places unlike Espresso Mania. |
| Cafe | 250<X<500 | EKLER | 263.6 | CHOKOLADNITSA | 450 | 3 | 68 | **Cafe 250–500 m²**: The rent range shows a 68% difference. Ekler must be situated in a low-traffic zone, as its rate is very low and requires checking. |
| Cafe | 50<X<100 | DAILY FRESH | 51.2 | DUNKIN DONUTS | 100 | 2 | 36 | **Cafe 50–100 m²**: A 36% rent difference. Daily Fresh's rate is low but business performance is unsatisfactory, suggesting a location check. |
| Cafe | 100<X<250 | KOFEIN TERRITORY OF COFFEE | 239 | COFFEE HOUSE | 120 | 2 | 65 | **Cafe 100–250 m²**: The rent range exhibits a 65% difference. Rates are fair for both tenants due to premise scale. |
| Children store | 1500<X<5000 | DETI | 3074.5 | DETSKY MIR | 3621.4 | 2 | 13 | **Children Store 1,500–5,000 m²**: A 13% rent difference. Deti, a new brand to the market with ~3,000 m² leased area, is situated in a low-traffic zone with a fair rate. |
| Childrens wear/ maternity | 50<X<100 | KANZ | 84.7 | TOUTCOMPTEFAIT | 69 | 5 | 50 | **Children's Wear/Maternity 50–100 m²**: The rent range shows a 50% difference. Rates are ok for both tenants. |
| Childrens wear/ maternity | 100<X<250 | JUSTICE | 229 | ACOOLA | 128 | 3 | 69 | **Children's Wear/Maternity 100–250 m²**: A 69% rent difference. Rates are ok for both tenants considering the leased area; Acoola needs sales dynamic monitoring in future periods. |
| Childrens wear/ maternity | 250<X<500 | MOTHERCARE | 360 | PRENATAL | 315 | 2 | 51 | **Children's Wear/Maternity 250–500 m²**: The rent range exhibits a 51% difference. Prenatal's rate could be adjusted, as it's not a well-known brand and may need support from the shopping center. |
| Clocks watches and repair | 50<X<100 | HOUR PASSION | 87.7 | CONSUL | 87.7 | 2 | 34 | **Clocks Watches and Repair 50–100 m²**: A 34% rent difference. Rates are ok for both tenants in this category. |
| Computer/ software | <50 | GAME | 42 | RESPUBLIKA IGR | 47.2 | 2 | 13 | **Computer/Software <50 m²**: The rent range shows a 13% difference. Rates are ok for both tenants in this category. |
| Cosmetics | 100<X<250 | ORIFLAME | 111.9 | ILE DE BEAUTE | 218.1 | 3 | 36 | **Cosmetics 100–250 m²**: A 36% rent difference. Oriflame has a lower rate due to location and its network marketing brand nature, not as a traditional physical shop; needs performance dynamic review. |
| Electronics general | SubAnchors | MEDIA MARKT | 8275.7 | MVIDEO | 5771.3 | 2 | 22 | **Electronics General Sub-Anchors**: The rent range exhibits a 22% difference. Rates are ok for both tenants in this category. |
| Entertainment | <50 | TRANSFORCE | 19 | LUNAPARK SAFARY | 11 | 4 | 62 | **Entertainment <50 m²**: A 62% rent difference. Transforce's rate could be higher due to great location near the Kinostar cinema. |
| Entertainment | SubAnchors | KINOSTAR DELUXE | 9415.7 | COSMIK | 5851.7 | 2 | 69 | **Entertainment Sub-Anchors**: The rent range shows a 69% difference. Cosmik's rate raises questions and needs adjustment. |
| Family fashion | 500<X<1000 | MEXX | 951.9 | GAP | 618.7 | 9 | 68 | **Family Fashion 500–1,000 m²**: A 68% rent difference. Mexx's rate could be adjusted to higher. |

| Category | Range | Tenant A | Area A | Tenant B | Area B | n | Diff | Comment |
|---|---|---|---|---|---|---|---|---|
| Family fashion | 100<X<250 | PRIVATE SPACE | 199 | TIMBERLAND | 144.5 | 7 | 60 | **Family Fashion 100–250 m²**: The rent range exhibits a 60% difference. Private Space, not a well-known brand, could have its rate adjusted higher; needs inspection. |
| Family fashion | 50<X<100 | ELITE SPORT | 100.6 | BOSCO | 70.2 | 3 | 34 | **Family Fashion 50–100 m²**: A 34% rent difference. Rates are ok for both tenants. |
| Family fashion | 1500<X<5000 | ZARA | 2431.1 | HANDM | 2653.4 | 3 | 8 | **Family Fashion 1,500–5,000 m²**: The rent range shows a 8% difference. Rates are ok for both tenants. |
| Fast food | 100<X<250 | PRIMO PIZZA | 138.8 | SBARRO | 129.4 | 3 | 59 | **Fast Food 100–250 m²**: A 59% rent difference. Primo Pizza, a network operating from the center's opening, has special rent conditions that are low and must be adjusted over time. |
| Fast food | <50 | KEBAB HOUSE | 44.3 | KROSHKA KARTOSHKA | 38.3 | 2 | 20 | **Fast Food <50 m²**: The rent range exhibits an 20% difference. Kebab House's rate could be adjusted higher. |
| Fast food | 50<X<100 | VOSTOCHNY BAZAR | 78.3 | SUBWAY | 71 | 2 | 2 | **Fast Food 50–100 m²**: A 2% rent difference. Rates are ok for both tenants in this category. |
| Fur & leather | 1500<X<5000 | LADY AND GENTLEMAN CITY | 2749.1 | SNEZHNAYA KOROLEVA | 1924 | 2 | 31 | **Fur & Leather 1,500–5,000 m²**: The rent range shows a 31% difference. Rates are ok for both tenants in this category. |
| Gifts and cards | <50 | PODAROCHNAYA | 18 | EXPEDITSIA | 28.7 | 3 | 43 | **Gifts and Cards <50 m²**: A 43% rent difference. Podarochnaya seems located in a low-traffic cluster; needs inspection. |
| Gifts and cards | 50<X<100 | LE FUTUR | 61.6 | HALLMARK | 52 | 2 | 6 | **Gifts and Cards 50–100 m²**: The rent range exhibits a 6% rent difference. Rates are ok for both tenants. |
| Hairdresser | 50<X<100 | MILO | 91.4 | MIN O MIN | 69.9 | 2 | 25 | **Hairdresser 50–100 m²**: A 25% rent difference. Rates are ok for both tenants in this category. |
| Health and wellness | <50 | LUSH | 45.9 | BOTTEGA VERDE | 27.2 | 4 | 55 | **Health and Wellness <50 m²**: The rent range shows a 55% difference. Bottega Verde needs inspection to assess business performance. |
| Health and wellness | 50<X<100 | BODY SHOP | 77.7 | LOCCITANE | 53 | 2 | 66 | **Health and Wellness 50–100 m²**: A 66% rent difference. Two strong brands in the same category; Body Shop seems to have special contract conditions that can be adjusted over time, with rent potentially higher for this tenant. |
| Ice cream | <50 | BASKIN ROBBINS | 30 | GELATISSIMO | 28 | 3 | 15 | **Ice Cream <50 m²**: The rent range exhibits a 15% difference. Baskin Robbins, a well-known brand, could pay higher rent. |
| Jewelry | 50<X<100 | MOSCOW JEWELRY FACTORY | 60.8 | OXETTE | 53.5 | 3 | 22 | **Jewelry 50–100 m²**: A 22% rent difference. Rates are ok for both tenants in this category. |
| Mens fashion | 100<X<250 | ROMANO BOTTA | 216.8 | CAMEL | 125.5 | 8 | 59 | **Men's Fashion 100–250 m²**: The rent range shows a 59% difference. Romano Botta needs inspection of sales performance; the rent could be higher. |
| Mens fashion | 50<X<100 | GIOVANE GENTILE | 93.2 | WINDSOR KNOT | 53.7 | 2 | 18 | **Men's Fashion 50–100 m²**: A 18% rent difference. Rates are ok for both tenants in this category. |
| Mobile phones | 100<X<250 | ION | 151 | MTS | 101 | 2 | 30 | **Mobile Phones 100–250 m²**: The rent range exhibits a 30% difference. Rates are ok for both tenants in this category. |
| Newspaper/ Tobacco | <50 | HOROSHIE NOVOSTI | 37 | TABACCOS | 27.2 | 2 | 25 | **Newspaper/Tobacco <50 m²**: A 25% rent difference. Rates are ok for both tenants in this category. |
| Optician/ sunglasses | 50<X<100 | OPTIC EXPRESS | 61 | OCHKARIK | 53.1 | 4 | 22 | **Optician/Sunglasses 50–100 m²**: The rent range shows a 22% difference. Rates are ok for both tenants in this category. |
| Restaurant | 100<X<250 | SUSHI SAN | 233.7 | YO SUSHI | 142 | 2 | 64 | **Restaurant 100–250 m²**: A 64% rent difference. Sushi San, a network operating from the center's opening, has special rent conditions that are low and must be adjusted over time. |
| Shoes | 100<X<250 | SKETCHERS | 140.3 | RESPECT | 204.9 | 15 | 53 | **Shoes 100–250 m²**: The rent range exhibits a 53% difference. Rates are ok for both tenants in this category. |
| Shoes | 50<X<100 | EL MONTE | 74.5 | CROCS | 75.7 | 11 | 57 | **Shoes 50–100 m²**: A 57% rent difference. Location and sales indicators of El Monte tenant must be checked, as the rent is low. |

| Category | Range | Tenant A | Value A | Tenant B | Value B | # | % | Notes |
|---|---|---|---|---|---|---|---|---|
| Shoes | 250<X<500 | EGLE | 269.2 | EXIST | 351 | 4 | 35 | **Shoes 250–500 m²**: The rent range shows a 35% difference. Both tenants must be checked in terms of rent conditions, location, marketing policies, and overall performance. |
| Shoes | 500<X<1000 | RENDEZVOUS | 524.5 | CENTRO | 570 | 2 | 41 | **Shoes 500–1,000 m²**: A 41% rent difference. Rendez-Vous needs to be checked in terms of sales performance and contract rent conditions. |
| Specialty food and wine | <50 | ZUMO | 28 | UNTSIYA | 14.8 | 4 | 21 | **Specialty Food and Wine <50 m²**: The rent range exhibits a 21% difference. Rates are ok for both tenants in this category. |
| Specialty food and wine | 50<X<100 | MLESNA | 60.49 | VITOMIN | 61.6 | 2 | 67 | **Specialty Food and Wine 50–100 m²**: A 67% rent difference. Mlesna tea shop has a lower rate than Vitomin juice café; inspection could be held. |
| Sporting goods | 100<X<250 | ADIDAS ORIGINALS | 223.2 | VIKING STYLE | 159.5 | 7 | 46 | **Sporting Goods 100–250 m²**: The rent range shows a 46% difference. Rates are ok for both tenants in this category. |
| Sporting goods | 500<X<1000 | RBK | 729.2 | BAON DESAM | 526.6 | 3 | 30 | **Sporting Goods 500–1,000 m²**: A 30% rent difference. Rates are ok for both tenants in this category. |
| Toys and games | <50 | ORANGE ELEPHANT | 28.5 | MARVINS MAGIC | 21.3 | 3 | 31 | **Toys and Games <50 m²**: The rent range exhibits a 31% difference. Rates are ok for both tenants in this category. |
| Toys and games | 100<X<250 | EARLY LEARNING CENTER | 174 | SEM PYADEI | 127.2 | 3 | 53 | **Toys and Games 100–250 m²**: A 53% rent difference. Rates are ok for both tenants in this category. |
| Toys and games | 50<X<100 | POPUGAY TOY | 100 | LEGO | 69.7 | 2 | 57 | **Toys and Games 50–100 m²**: The rent range shows a 57% difference. Popugay Toy needs inspection of location in cluster. |
| Woman's specialty/lingerie | 50<X<100 | DEMUAZEL DORE | 64.5 | ATLANTIC | 54.9 | 6 | 63 | **Women's Specialty/Lingerie 50–100 m²**: A 63% rent difference. Demuazel Dore needs inspection of location and sales performance to potentially increase the rent. |
| Woman's specialty/lingerie | 100<X<250 | OYSHO | 216.4 | TEZENIS | 158.8 | 5 | 61 | **Women's Specialty/Lingerie 100–250 m²**: The rent range exhibits a 61% difference. Rates are ok for both tenants in this category. |
| Womans fashion | 250<X<500 | KOTON | 274.2 | STRADIVARIUS | 439.3 | 6 | 40 | **Women's Fashion 250–500 m²**: A 40% rent difference. Koton needs inspection. |
| Womans fashion | 50<X<100 | AMN | 60.8 | WAGGON | 72.2 | 4 | 44 | **Women's Fashion 50–100 m²**: The rent range shows a 44% difference. AMN needs inspection. |
| Womans fashion | 500<X<1000 | MODAMO | 808.5 | NEW LOOK | 638.6 | 2 | 16 | **Women's Fashion 500–1,000 m²**: A 16% rent difference. Rates are ok for both tenants. |
| Young fashion | 100<X<250 | CROPP TOWN | 238.8 | ULTRA | 111.7 | 5 | 48 | **Young Fashion 100–250 m²**: The rent range exhibits a 48% difference. Rates are ok for both tenants in this category. |
| Young fashion | 50<X<100 | TVOE | 77.7 | REVIEW | 78.3 | 3 | 41 | **Young Fashion 50–100 m²**: A 41% rent difference. Tvoe needs inspection. |
| Young fashion | 250<X<500 | CASTRO | 329.5 | SEPPALA | 495 | 2 | 0 | **Young Fashion 250–500 m²**: The rent range shows a 0% difference. Rates are ok for both tenants. |
| Young fashion | 1000<X<1500 | TOP SHOP TOPMAN MISS SELFRIDGE | 1233.1 | NEW YORKER | 1062.3 | 2 | 40 | **Young Fashion 1,000–1,500 m²**: A 40% rent difference. Rates are ok for both tenants. |
| Clocks watches and repair | <50 | SWATCH | 30.1 | MASTER MINUTKA | 1 | 7 | 76 | **Clocks Watches and Repair <50 m²**: The rent range shows a 76% difference. Master Minutka, a clock repair operator with only 1 m², has a high rate, while Swatch pays significantly less. |
| Family fashion | 250<X<500 | BENETTON SISLEY | 363.1 | FINN FLARE | 483.5 | 7 | 71 | **Family Fashion 250–500 m²**: A 71% rent difference. Benetton Sisley's rate appears very low and could be reconsidered. |
| Family fashion | 1000<X<1500 | BHS | 1059.2 | UNIQLO | 1345 | 4 | 73 | **Family Fashion 1,000–1,500 m²**: The rent range exhibits a 73% difference. BHS, operating from the center's opening, has a low rate that should be reconsidered over time. |
| Jeans shop | 100<X<250 | CALVIN KLEIN JEANS | 189.8 | WESTLAND | 109.6 | 9 | 75 | **Jeans Shop 100–250 m²**: A 75% rent difference. Calvin Klein Jeans, as a well-known traffic driver, has a low rate. |
| Jewelry | <50 | SWAROVSKI | 36 | DIADEMA | 15 | 7 | 72 | **Jewelry <50 m²**: The rent range shows a 72% difference. Rates are ok for both tenants in this category. |

| Category | Size band | Min tenant | Min rate | Max tenant | Max rate | Total tenants | % | Comments |
|---|---|---|---|---|---|---|---|---|
| Mobile phones | 50<X<100 | EVROSET | 53.4 | NOKIA | 97.3 | 2 | 97 | **Mobile Phones 50–100 m²**: A 97% rent difference. Evroset, specialized in SIM cards selling and mobile phones as a support service, has a low rate; sales performance should be checked in the future. |
| Restaurant | 250<X<500 | LAS PALMOS | 360 | MILOS | 443 | 5 | 81 | **Restaurant 250–500 m²**: The rent range exhibits an 81% difference. Milos restaurant is experiencing sales issues; a deep check is needed to understand how the shopping center can help increase business efficiency. |
| Womans fashion | 100<X<250 | MORGAN | 110.7 | MARELLA | 184 | 17 | 87 | **Women's Fashion 100–250 m²**: A 87% rent difference. Morgan appears to have special contract rent conditions; the rate could be reconsidered in the future. |
| Young fashion | 500<X<1000 | BESTSELLER SEPPALA | 699 | QUICKSILVER | 673 | 5 | 71 | **Young Fashion 500–1,000 m²**: The rent range shows a 71% difference. Seppala, a former Stockmann tenant, has special rent conditions; overall performance needs checking. |

The table outlines tenant names with the minimum and maximum rent rates per m² across subcategories and premises size bands, including leased areas, total tenants per group and % of difference between min rent and max rent. This provides a clear view of rental pricing variability and its alignment with tenant performance and location.

**Overall picture**: The rent structure continues to favor larger tenants and established brands with lower rates per m², while smaller or less-known tenants in specialty categories pay significantly higher rates, with differences frequently in the 40-50% range. Several tenants with notably low rates (e.g., Benetton Sisley, BHS, Evroset, Morgan) benefit from special conditions or historical contracts, while others (e.g., Milos, Cosmik) show performance issues that warrant closer review. This variability supports targeted rent adjustments based on sales dynamics, location, and tenant contribution to traffic and revenue, particularly in fashion, food, and specialty segments.

Each individual case should be reviewed comprehensively, taking into account not only rent levels but also actual sales performance, occupancy cost ratio (OCR), marketing policy, and the tenant's precise location within the center. Such a holistic approach enables the shopping center to provide effective support to tenants, helping them improve business efficiency. This measure is equally applicable to tenants with low performance indicators (to address weaknesses and stabilize operations) and to those with strong sales results (to further enhance and maximize their outcomes).

# 7.4. Occupancy Cost Ratio (OCR) analysis.

Data is calculated in adjusted_OCR_fy2010_percent и adjusted_OCR_fy2011_percent (taking into account days of activity) united into final table with main trend and status.



Distribution of Ocupancy Cost Ratio Trend Status by tenants category.
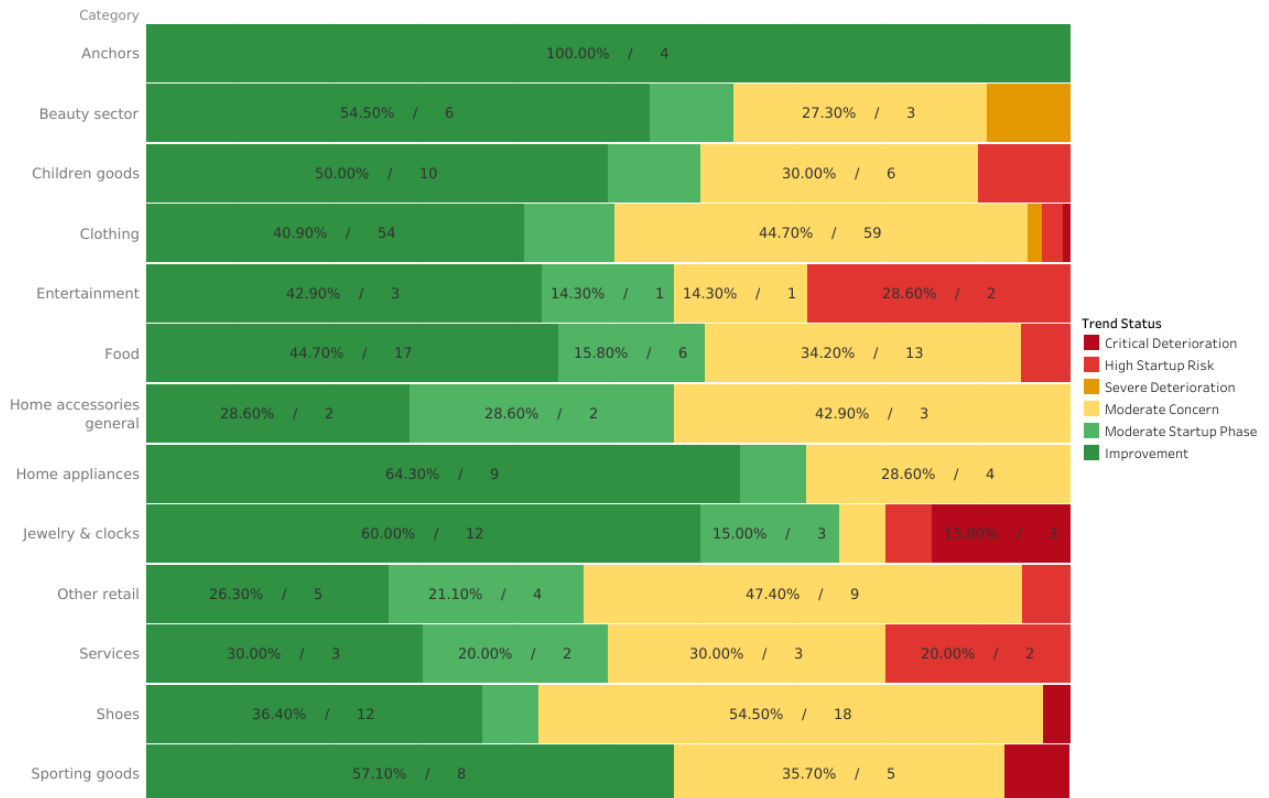
This 100% stacked bar chart illustrates trend status - the proportion of adjusted OCR trend statuses across major tenant categories, highlighting how relative rental costs evolved from FY 2010 to FY 2011.

### Key observations:

- **Clothing** — the largest category with 132 tenants — shows a mixed picture: ~45% of tenants fall into Moderate Concern, while 40.9% improved. Critical and Severe deterioration are present but limited (0.8% and 1.5%), yet the high share of negative trends signals growing pressure on profitability in the core fashion segment.
- **Beauty sector and Jewelry & clocks** remain the highest-risk groups: Beauty has 27.3% in Moderate Concern and 9.1% Severe Deterioration — nearly 36% of tenants face serious challenges. Jewelry shows 15% Critical and 5% High startup risk and 5% Moderate Concern — together with 20% Moderate Startup Phase, this category is among the most vulnerable.
- **Anchors** demonstrate exceptional stability and improvement: 100% green (Improvement) — the backbone of the center remains resilient, benefiting from high turnover and strategic positioning.
- **Entertainment** — a key addition in Phase 2 with 5 tenants (e.g., Kinostar cinema, bowling, family attractions) — shows a positive but cautious dynamic: 42.9% of tenants improved their OCR, reflecting successful ramp-up and increased dwell time. However, 28.6% fall into High Startup Risk, indicating that some new entertainment operators are still adjusting to revenue growth

against fixed costs. This category plays a vital role in transforming MEGA into a true family day-out destination, but requires close monitoring to ensure long-term viability.

- **Food and Sporting goods** exhibit more balanced and positive trends: Food has 44.7% Improvement and only 5.3% High Startup Risk. Sporting goods follows with 57.1% Improvement — these categories prove more resistant to cost pressures.
- **Overall trend:** While ~40–60% of tenants across most categories improved or remained stable, approximately 30–50% in key segments (Clothing, Beauty, Jewelry) faced rising relative rental costs. Entertainment's mixed results highlight the double-edged nature of lifestyle additions: they enhance visitor experience but can introduce startup risks if sales ramp-up lags behind fixed costs.

**Conclusion & recommendation:** The data highlights a clear polarization: anchors and food/sport categories are stable or improving, while fashion and premium retail face increasing risks. Entertainment's Phase 2 introduction adds significant value but requires targeted support (e.g., marketing, rent relief) to minimize high startup risks and maximize long-term contribution to dwell time and revenue.

This visualization emphasizes that while the center as a whole is recovering, certain segments remain under strain from rising relative rental costs. Strategic actions — such as rent renegotiation, performance support programs, or tenant mix adjustments — are essential to sustain occupancy and revenue growth in the post-crisis environment.

### Occupancy Cost Ratio (OCR) Trends: Post-Crisis Recovery and Persistent High Levels (FY 2010–2011)

Despite the overall positive trend of OCR reduction from FY 2010 to FY 2011, the majority of tenants continued to operate with elevated occupancy cost ratios. This situation can be largely attributed to the lingering effects of the global financial crisis of 2008–2009. The decline in real household incomes and the slow recovery of consumer demand resulted in sales growth that lagged behind pre-crisis levels, while rental rates either remained unchanged or decreased at a slower pace than needed to restore balance.

Nevertheless, tenants maintained their presence in the shopping center due to its unique traffic-generating power — driven primarily by anchor tenants such as Auchan, IKEA, and others — combined with the absence of comparable alternatives in the region. The positive sales momentum observed in FY 2011 (+13% compared to FY 2010) already began to ease the pressure on OCR, signaling a gradual restoration of equilibrium between rental burden and revenue generation.

In the detailed tenant analysis that follows, the focus will be placed exclusively on high-risk groups where the trend shows deterioration or persistent vulnerability. This targeted approach allows for prioritized monitoring and potential corrective measures to safeguard long-term tenant stability and center performance.

*** Tenant-level deep dive analysis is out of scope for the current version and is planned for a future iteration (v1.2) focusing on individual performance drivers.*

# 7.5. Turnover rent and its contribution to revenue.

**Rent Income Structure: Increasing Shift Toward Turnover-Based Model (FY 2010–2011)**



Rent Income Structure: Shift Toward Turnover-Based Model (FY 2010–2011).
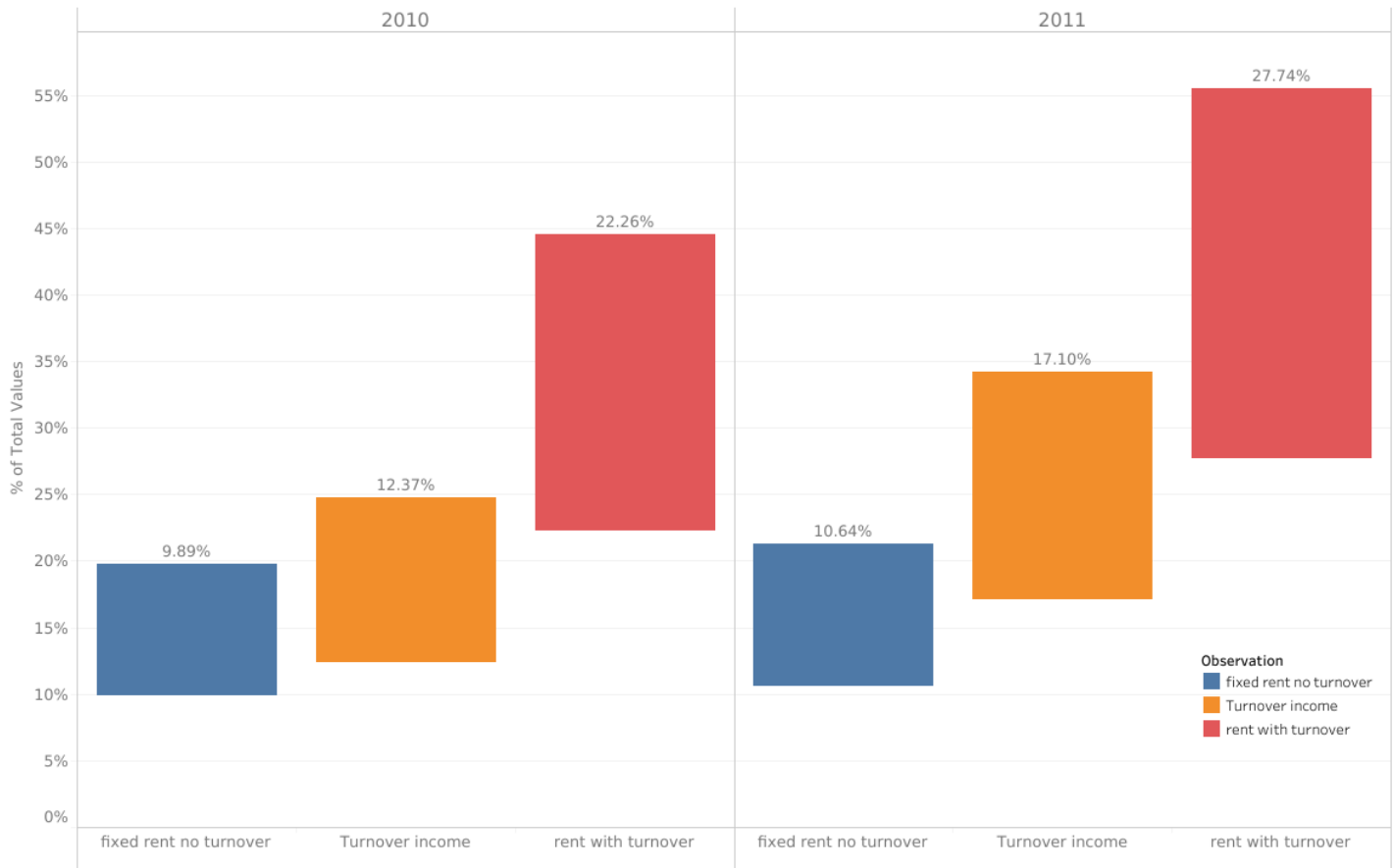
The chart illustrates the evolution of the shopping center's rent income structure between FY 2010 and FY 2011, expressed as percentages of total rent revenue. Due to the confidential nature of the underlying data, absolute figures are not disclosed; the visualization focuses on relative contributions from different rent models.

**Key observations:**

- The most significant positive development is the substantial increase in the share of rent with turnover (percentage-based rent), which grew from 22.26% in FY 2010 to 27.74% in FY 2011 — a relative increase of over 24% in just one year. This shift reduces the center's exposure to fixed rental risk and aligns incentives between the landlord and tenants: higher sales directly benefit both parties.

- At the same time, the proportion of fixed rent no turnover decreased noticeably from 9.89% to 10.64% (with a corresponding decline in relative importance), while turnover income (pure percentage-based) also showed growth from 12.37% to 17.10%.

**Strategic implications:**

This structural improvement enhances the shopping center's revenue resilience, motivates tenants to maximize sales performance, and supports long-term stability in an environment of gradual consumer demand recovery. The trend toward turnover-based rent is one of the most encouraging developments observed in the analyzed period.

Due to the confidential nature of the data, absolute sales and rent figures are not disclosed in the public version of the report. Instead, the chart presents the relative contribution of different rent models to the total rent income of the shopping center, expressed in percentages.

The visualization clearly demonstrates a positive shift in the rent structure during the analyzed period. The share of turnover-based rent (rent with turnover) increased significantly from FY 2010 to FY 2011, reflecting a growing preference for this model among key tenants.

This transition reduces the shopping center's exposure to fixed rental risk while aligning landlord and tenant interests — higher sales directly benefit both parties. The main contributors to the turnover-based rent model include:

- **Anchor tenants**: Auchan, IKEA, and OBI — the largest and most stable generators of traffic and revenue, whose performance strongly influences the overall share of turnover rent.

- **Fashion category leaders**: Zara, Bershka, and Lady & Gentlemen City — high-performing brands that consistently deliver strong sales volumes.

- **Food & Beverage anchor**: McDonald's — a reliable everyday traffic driver with stable and significant turnover.

The increase in the proportion of turnover-based rent, combined with the overall sales growth observed across most categories in FY 2011, indicates improving tenant efficiency and a more balanced risk profile for the center. This trend supports long-term revenue stability and creates incentives for tenants to maximize sales performance.

This structural improvement is one of the key positive developments in the analyzed period and highlights the center's ability to adapt its commercial policy to changing market conditions while maintaining strong partnerships with leading brands.

# 7.6. Conclusion EDA.

### Summary of Key Findings

The exploratory data analysis (EDA) of the shopping center's tenant performance from September 2009 to August 2011 reveals a robust recovery trajectory following the 2008–2009 financial crisis. Total sales grew by 13% from FY 2010 to FY 2011, with positive dynamics across most categories, driven by seasonal peaks (December and January) and steady contributions from anchors and sub-anchors. Sales density showed variability, with strong performers consistently exceeding category averages (up to 150–200% above benchmark), while underperformers lagged below 100%. Occupancy Cost Ratio (OCR) remained elevated for the majority of tenants (often >18%), but demonstrated a downward trend in FY 2011, reflecting improving sales efficiency. Rent income structure shifted positively toward turnover-based models, increasing from 22% to 28% of total rent, reducing fixed-rate dependency.

Key highlights include:

- **Anchors and Sub-Anchors**: Dominated by Auchan, IKEA, OBI, MediaMarkt, M.Video, and Decathlon, these tenants generated the highest volumes with pronounced seasonality (December peaks up to 50–100% above average) and stable year-over-year growth.

- **Fashion and Apparel**: Categories like Clothing, Shoes, and Children's Goods led non-anchor performance, with leaders (H&M, ZARA, Bershka) showing strong results, though some (Topshop, BHS, Cult) exhibited declines or closures.

- **Food & Entertainment**: McDonald's and Kinostar excelled, with Entertainment spiking in January 2011 (likely due to promotions), while Cosmik underperformed, raising concerns.

- **Rent Variability**: Larger premises enjoyed lower rates per m² (30–80% differences in small formats), with opportunities for adjustments in underperformers (e.g., Ekler, Private Space).

## Positive Aspects

The center demonstrated resilience amid post-crisis challenges:

- Sales trends were upward in 2011, with categories like Home Accessories (+190% relative growth) and Children Goods (+49%) showing the strongest increases.

- The increasing adoption of turnover-based rent aligned incentives, motivating tenants to boost sales and contributing to OCR reduction.

- High tenant retention despite elevated OCR indicates the center's unique traffic appeal, supported by anchors and Phase 2 expansion.

## Areas of Concern

- Persistent high OCR (>20% in some groups) signals potential vulnerability, particularly in small-format and specialty categories (e.g., Jewelry, Services).

- Underperforming tenants (e.g., Ekler, Cult, Estelle a Store, Bliss, Cosmik, Obuv 21 Veka) showed low density and negative trends, often linked to location issues or weak marketing.

- Declining relative density in specific brands (e.g., Prenatal, Ichi, Marco Polo, Sinequanone, Pilgrim, Zen) highlights risks in maturing categories.

## Recommendations

To capitalize on growth and address risks:

- **Monitor High-Risk Groups**: Prioritize detailed reviews for tenants with deteriorating trends or OCR >20% (15–20% of mix), focusing on sales, OCR, marketing, and location to enhance efficiency.

- **Rent Adjustments**: Negotiate targeted increases for underperformers with low rates (e.g., Ekler, Koton, AMN, Demuazel Dore) and consider reductions/support for vulnerable ones (e.g., Cosmik, Milos) to balance occupancy and revenue.

- **Promote Turnover-Based Models**: Expand this approach to more tenants (aim for 35–40% by FY 2012), as it reduces risk and motivates sales growth — especially in fashion and food.

- **Tenant Support**: Implement joint marketing campaigns (e.g., like Stockmann's Crazy Days) for weak performers and provide location audits/relocations to boost traffic.

- **Overall Optimization**: Conduct annual EDA to track OCR trends, focusing on post-crisis recovery factors like consumer spending rebound. Explore adding high-density categories (e.g., more jewelry/cafes) to diversify mix.

The shopping center's performance in 2010–2011 positions it well for sustained growth, with a balanced tenant mix and improving efficiency. Continued focus on data-driven adjustments will further strengthen its market resilience.

# 9. Dashboards & Tools

Pie chart: Leased area allocation by size category.
https://public.tableau.com/app/profile/marina.vasileva1316/viz/LeasedAreaDistributionbyPremisesSize_/Leasedareaallocation

Leased Area Distribution by Business Category and Premises Size
https://public.tableau.com/app/profile/marina.vasileva1316/viz/LeasedAreaDistributionbyBusinessCategoryandPremisesSize_/Areabycategoryandpremise

Tenant Count and Category Mix.
https://public.tableau.com/app/profile/marina.vasileva1316/viz/TenantCountandCategoryMix_/Tenantdistr

Leased area MEGA SC Phase.
 https://public.tableau.com/app/profile/marina.vasileva1316/viz/LeasedareaMEGASCPhase_/Leasedarea1

Leased area MEGA SC Phase 2
https://public.tableau.com/app/profile/marina.vasileva1316/viz/LeasedareaMEGASCPhase2_/Leasedarea2

Vacant GLA, zero-revenue tenants sep2009-aug2011
https://public.tableau.com/app/profile/marina.vasileva1316/viz/VacantGLAzero-revenuetenantssep2009-aug2011/Vacantareanum_oftenants

Average monthly trends: sep2010 - aug2011
https://public.tableau.com/app/profile/marina.vasileva1316/viz/Averagemonthlytrendssep2010-aug2011/AVGMonthlytenantssales

YoY Sales performance per category % change
https://public.tableau.com/app/profile/marina.vasileva1316/viz/YoYSalesperformancepercategorychange/table

Sales density 2010-2011 % deviation.
https://public.tableau.com/app/profile/marina.vasileva1316/viz/Salesdensity2010-2011deviation_/Salesdensity

Correlation average rent per m2 per premise sq m category and tenant business subcategory.
https://public.tableau.com/app/profile/marina.vasileva1316/viz/Correlationaveragerentperm2perpremisesqmcategoryandtenantbusinesssubcategory_/Dashboard5

OCR by tenant category.
https://public.tableau.com/app/profile/marina.vasileva1316/viz/OCRbytenantcategory_/DistOCR

Shopping center rent income structure.
https://public.tableau.com/app/profile/marina.vasileva1316/viz/Shoppingcenterrentincomestructure_/Dashboard5


Tools used: Excel, MySQL / Dbeaver, Tableau.

# Appendix 1.

**Metadata and Description of the Table "Sales BD" from "1 Tenant_sales_MegaBD_raw_data.xlsx".**

This table appears to be a raw dataset from the MEGA Belaya Dacha (BD) shopping center in Moscow, Russia, containing information on tenants' performance, rent rates, and monthly sales data for the period from September 2009 to August 2011. It is likely part of a historical retail analysis dataset, focusing on tenant metrics during the post-2008 crisis recovery. The data is structured as a standard Excel sheet with headers in row 1 and data starting from row 2, including an average row at the end (row 411).

**Metadata Overview.**

- **File Name**: 1 Tenant_sales_MegaBD_raw_data.xlsx
- **Sheet Name**: Sales BD (id: 0)
- **Number of Rows**: 411 (including 1 header row, 409 data rows, and 1 average row at the end)
- **Number of Columns**: 36 (12 general tenant information columns + 24 monthly sales columns)
- **Data Types** (based on Excel content and common assumptions; verify with =TYPE() for specific cells):
  o Text/String: Tenant name, Business category, Business subcategory, Suite #, Category m2, Phases (TYPE=2)
  o Number: Leased Area Reported, Rent rate m2 FY 2010, Monthly sales columns (TYPE=1)
  o Percentage: % TNR (likely formatted as number, TYPE=1)
  o Date: Start date of TNR, End date of TNR (may be text or date format, TYPE=2 or 1)
  o Error: Any #N/A or #REF! (TYPE=16) — presented and need to be cleaned for further anmalysis
- **File Format**: Excel (.xlsx)
- **Approximate Size**: Truncated in the document (131,468 characters omitted), but full sheet is 543 KB based on 411 rows x 36 columns
- **Data Period**: Monthly sales from SEP 2009 to AUG 2011 (24 months, covering FY 2010 and 2011)
- **Key Assumptions**: Data is historical retail metrics; some columns (e.g., monthly sales) may contain zeros or nulls for inactive tenants; potential inconsistencies (e.g., mixed date formats) as common in raw exports.

**Column Descriptions.**

The table has two main parts: tenant profile (first 12 columns) and monthly sales data (columns 13–36). Here's a breakdown:

1. **Tenant name** (Text): Name of the tenant (e.g., "& STYLE", "ADIDAS").
2. **Business category** (Text): Broad category of the tenant's business (e.g., "Clothing", "Sporting goods").
3. **Business subcategory** (Text): More specific subcategory (e.g., "Family fashion", "Sporting goods").
4. **Suite #** (Text): Tenant suite number (e.g., "M07_2040").
5. **Category m2** (Text): Size category of the leased area (e.g., "100<X<250").
6. **Tenants with TNR** (Number): Indicator if the tenant has Turnover Rent (TNR) component (e.g., 1 = yes).
7. **% TNR** (Percentage/Number): Turnover rent percentage (e.g., 10 for 10%).
8. **Start date of TNR** (Date/Text): Start date for turnover rent application (e.g., " 4/1/2010").
9. **End date of TNR** (Date/Text): End date for turnover rent (e.g., " 07/30/2012 ").
10. **Leased Area Reported** (Number): Reported leased area in m$^2$ (e.g., 121).
11. **Phases** (Number/Text): Phase of the shopping center (e.g., 1 or 2).
12. **Rent rate m2 FY 2010** (Number): Rent rate per square meter per year (e.g., 40000). NOTE: I assume that this rent rwill be used for analysis for both financial years 2010,2011.

13–36. **Monthly sales columns** (Number): Sales data for each month from SEP 2009 to AUG 2011 (e.g., "SEP 2009", "OCT", ..., "AUG"). Values are in RUB (e.g., 0, 405650.5, up to large numbers like 2.4E+09 for averages).

**Aggregate Rows (352–411).**

**Rows 352 through 411 in the "Sales BD"** sheet contain aggregated values calculated at the category and subcategory levels. These include metrics such as average sales per square meter, average rent rates, and other summary statistics derived from the individual tenant data (rows 2–351).

These aggregated rows serve as quick reference summaries and were generated automatically during the original data export. They are not used directly in the core analysis. All relevant calculations, aggregations, and metrics (including averages, totals, and derived KPIs) are recalculated and verified during the SQL processing stage to ensure accuracy, consistency, and full control over the methodology. This approach eliminates any risk of relying on pre-computed values that may contain errors or outdated logic from the source system. The raw tenant-level data (rows 2–351) remains the single source of truth for all further transformations and analysis.

**Table Description.**

- **Purpose**: The table tracks tenant performance in the MEGA Belaya Dacha shopping center, focusing on sales, rent, and turnover rent metrics. It is designed for analyzing tenant mix, revenue contribution, and occupancy cost ratios (OCR) during a post-crisis period (2009–2011). The data originates from an internal reporting system (e.g., Maconomy), with monthly sales enabling time-series analysis, seasonality detection, and breakpoint calculations for turnover rent.
- **Key Features**:
o Covers 409 tenants (rows 2–410), with an average row at the end.
o Monthly sales allow for aggregation into FY 2010 (SEP 2009–AUG 2010) and FY 2011 (SEP 2010–AUG 2011).
o Includes TNR (turnover rent) details for performance-based leasing analysis.
o Potential issues: Truncated values in large monthly sales (e.g., scientific notation like 2.4E+09), possible NULLs or errors in dates/rates.
- **Use Cases**: Ideal for EDA, calculating OCR, identifying high/low performers, phase comparisons (1 vs 2), and visualizing trends in Tableau/SQL.

**Incorrect Formats and Standardization.**

During the initial data review in Excel, using the TYPE() function, several formatting issues were identified and addressed to ensure full compatibility with subsequent SQL analysis. These inconsistencies are typical for historical retail datasets (2009–2011) exported from internal reporting systems with mixed manual input.



The following problems were systematically corrected:

- **Error values (#N/A, #REF!)** — detected as TYPE=16. These cells, usually caused by missing or broken references in the source file, were replaced with NULL values. This accurately reflects data unavailability and prevents calculation errors in SQL, while maintaining dataset integrity.

- **Date formats** — inconsistent representations (DD/MM/YYYY, mixed variants, text dates) were converted to the ISO-compliant YYYY-MM-DD format for both turnover dates (start_date_tnr, end_date_tnr) and monthly sales column headers. This guarantees correct handling by SQL date functions and time-series operations.

- **Currency symbols** — symbols such as ₽ and € were removed from monetary columns (e.g., rent_per_year, monthly sales), and values were converted to clean numeric types (integer or decimal). This step enabled reliable aggregation and calculations (sum, OCR, etc.).

- **String inconsistencies** — extra spaces, leading/trailing whitespace, and commas used as thousands of separators in numeric fields were eliminated. Column names were cleaned and renamed to remove special characters (!, _, ', etc.), making them fully SQL-friendly.

- **Category & subcategory names, tenants with turnover** — all values were standardized to Title Case, trimmed, and made consistent to avoid grouping or filtering errors during analysis.

- **Columns renamed to the following**: tenant_name, category, subcategory, premise, category_sqm, tnr_tenant, tnr_perc, start_date_tnr, end_date_tnr, leased_area, build_phase, rent_sqm, 2009-09-30, 2009-10-31, 2009-11-30, 2009-12-31, 2010-01-31, 2010-02-28, 2010-03-31, 2010-04-30, 2010-05-

31, 2010-06-30, 2010-07-31, 2010-08-31, 2010-09-30, 2010-10-31, 2010-11-30, 2010-12-31, 2011-01-31, 2011-02-28, 2011-03-31, 2011-04-30, 2011-05-31, 2011-06-30, 2011-07-31, 2011-08-31
The data was saved into CSV file for further exportation into DBEAVER.

# Appendix 2.

**Handling Duplicate Tenant Entries**
During the data exploration phase, multiple instances of the same tenant brand were identified 13 tenants in the dataset (e.g., BASKIN ROBBINS with 2 entries, CHOKOLADNITSA with 2, GELATISSIMO with 2, MACDONALS with 2, MLESNA with 4, MUSETTI with 2, OKEAN SVEZHESTI with 2, PHOTOSPHERE with 2, PICCOLO with 4, RETAIL PROFILE with 5, ROSTIKS KFC with 2, STARBUCKS with 3, ZUMO with 3).
**Why duplicates occurred**
- The same brand operated **multiple premises/suites** within the shopping center (e.g., different food court locations, kiosks, or zones).
- Different premises had separate entries for leased area, rent rates, TNR agreements, and monthly sales.
- Some tenants had records across different phases or contract updates (Phase 1 vs Phase 2).

**Approach to handling duplicates**

To obtain a realistic, consolidated view of each brand's contribution to the center's revenue, occupancy, and turnover rent model, the following methodology was applied:
1. **Identification** — All tenants with identical tenant name were detected using conditional formatting in Excel file.
2. **Consolidation rules** — For each duplicated tenant, metrics were aggregated as follows:
   o Tenant name: copied as tenant name
   o Business category: copied as category
   o Business subcategory: copied as subcategory
   o Category m2 calculate according to summarized space of the occupied premises and calculated by LOOKUP vector formula.
   o Tnr tenant: copied from the data if the tenant has turnover % - we consider is as "yes"
   o leased_area: summed across all premises (total occupied space)
   o build_phase: set to the value where tenant presented the most (Phase 1 or 2 if mixed)
   o rent_sqm: copied from the data of all premises in case it's equal. Excluding **Rostics** tenant as it had different rent rates**: premise x* rent x+ premise y * rent y / sum (premise x, premise y)**
   o sales_fy2010 and sales_fy2011: summed per month.
3. **Result** — All duplicated entries were collapsed into a single, consolidated row per unique tenant brand, preserving the true scale of their operations and performance. The example is presented in Table below**.**
**Business rationale** Consolidating duplicates provides an accurate representation of each brand's economic footprint in MEGA Belaya Dacha. Without this step, duplicated records would artificially inflate tenant counts, distort averages (e.g., rent per sqm), and lead to incorrect conclusions about tenant mix, sales contribution, and the effectiveness of the turnover rent model.

| Tenant name trim / space | Business category | Business subcategory | Category m2 | tnr_tenant | % TNR | Leased Area Reported | Phases | Rent rate m2 FY 2010 |
|---|---|---|---|---|---|---|---|---|
| BASKIN ROBBINS | Food | Ice cream | <50 | yes | 12 | 30 | 1 | |
| CHOKOLADNITSA | Food | Cafe | 250<X<500 | yes | 17 | 450 | 2 | 37326 |
| GELATISSIMO | Food | Ice cream | <50 | no | | 28 | 1 | 75000 |
| MCDONALDS | Food | Fast food | 500<X<1000 | yes | 7 | 559 | 1 | 10500 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| MLESNA | Food | Specialty food and wine | 50<X<100 | no | 12 | 60.49 | 2 | 35000 |
| MUSETTI | Food | Cafe | <50 | yes | 12 | 33 | 1 | |
| OKEAN SVEZHESTI | Food | Specialty food and wine | <50 | no | | 12 | 2 | 65000 |
| PHOTOSPHERE | Other retail | Photo services | 50<X<100 | yes | 12 | 97 | 1 | |
| PICCOLO | Food | Ice cream | <50 | yes | 12 | 44 | 2 | |
| RETAIL PROFILE | other retail | Retail Profile | 100<X<250 | yes | 60 | 225 | 1 | 125000 |
| ROSTIKS KFC | Food | Fast food | 250<X<500 | yes | 9 | 326 | 2 | 28144 |
| STARBUCKS | Food | Cafe | 500<X<1000 | yes | 15 | 553.49 | 2 | |
| ZUMO | Food | Specialty food and wine | <50 | yes | 12 | 28 | 2 | 65000 |

# Appendix 3.

The CSV file converted into SQL query and inserted as a table into DBEAVER.

**Creating the table**

The part of the query is presented below:

```
use world;
CREATE TABLE Mega_sales (
    `tenant_name` VARCHAR(255) NOT NULL,
    `category` TEXT,
    `subcategory` TEXT,
    `premise` TEXT,
    `Category_sqm` TEXT,
    `tnr_tenant` TEXT,
    `tnr_perc` DOUBLE DEFAULT NULL,
    `start_date_tnr` TEXT,
    `end_date_tnr` TEXT,
    `leased_area` DOUBLE DEFAULT NULL,
    `build_phase` DOUBLE DEFAULT NULL,
    `rent_sqm` DOUBLE DEFAULT NULL,
    `2009-09-30` DOUBLE DEFAULT NULL,
    `2009-10-31` DOUBLE DEFAULT NULL,
    `2009-11-30` DOUBLE DEFAULT NULL,
    `2009-12-31` DOUBLE DEFAULT NULL,
    `2010-01-31` DOUBLE DEFAULT NULL,
    `2010-02-28` DOUBLE DEFAULT NULL,
    `2010-03-31` DOUBLE DEFAULT NULL,
    `2010-04-30` DOUBLE DEFAULT NULL,
    `2010-05-31` DOUBLE DEFAULT NULL,
    `2010-06-30` DOUBLE DEFAULT NULL,
    `2010-07-31` DOUBLE DEFAULT NULL,
    `2010-08-31` DOUBLE DEFAULT NULL,
    `2010-09-30` DOUBLE DEFAULT NULL,
```

```sql
    `2010-10-31` DOUBLE DEFAULT NULL,
    `2010-11-30` DOUBLE DEFAULT NULL,
    `2010-12-31` DOUBLE DEFAULT NULL,
    `2011-01-31` DOUBLE DEFAULT NULL,
    `2011-02-28` DOUBLE DEFAULT NULL,
    `2011-03-31` DOUBLE DEFAULT NULL,
    `2011-04-30` DOUBLE DEFAULT NULL,
    `2011-05-31` DOUBLE DEFAULT NULL,
    `2011-06-30` DOUBLE DEFAULT NULL,
    `2011-07-31` DOUBLE DEFAULT NULL,
    `2011-08-31` DOUBLE DEFAULT NULL,
        PRIMARY KEY (`tenant_name`)

) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

INSERT INTO Mega_sales
(tenant_name,category,subcategory,premise,Category_sqm,tnr_tenant,tnr_perc,start_
date_tnr,end_date_tnr,leased_area,build_phase,rent_sqm,`2009-09-30`,`2009-10-
31`,`2009-11-30`,`2009-12-31`,`2010-01-31`,`2010-02-28`,`2010-03-31`,`2010-04-
30`,`2010-05-31`,`2010-06-30`,`2010-07-31`,`2010-08-31`,`2010-09-30`,`2010-10-
31`,`2010-11-30`,`2010-12-31`,`2011-01-31`,`2011-02-28`,`2011-03-31`,`2011-04-
30`,`2011-05-31`,`2011-06-30`,`2011-07-31`,`2011-08-31`) VALUES
    ('AND STYLE','Clothing','Family
fashion','M07_2040','100<X<250','yes',10.0,'2010-04-07','2010-07-
31',121.0,1.0,40000.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,405650.5,826611.5,1113802.2,185
2296.0,1690702.0,1587522.0,2494672.0,1658219.5,2253078.6,2139039.2,2135836.0,1562
078.0,1716516.0,1578673.42,1650573.0,2139047.0,2057628.0),
    ('1C INTERES','Home appliances','Computer/
software','M13_4116','100<X<250','yes',7.0,'2009-07-31','2012-07-
31',111.6,2.0,55000.0,1890005.0,2106227.0,2670163.0,3964761.0,3117771.0,2158650.0
,2647718.0,1796384.0,1999322.0,1858177.0,2169222.0,2543620.0,2300552.0,3088001.0,
3235078.0,4819740.0,4425833.0,3108845.0,3204421.0,2752651.0,2744400.0,2692632.0,2
642118.0,2855399.0);
```

**Checking data limitations (missing rents).**

**Handling Approach** For these 37 tenants, rent_sqm values were imputed using the **average rent_sqm of the corresponding subcategory** (calculated only from tenants with valid rent data). This method provides a more accurate and category-specific estimation compared to using category-level averages, ensuring better alignment with business realities.

| tenant_name | category | subcategory | Category_sqm | leased_area | rent_sqm |
|---|---|---|---|---|---|
| IKEA | Anchors | Anchors | Anchors | 32108 | 3000 |
| AUCHAN | Anchors | Anchors | Anchors | 20140 | 4500 |
| SEPHORA | Beauty sector | Cosmetics | 250<X<500 | 452 | 45000 |
| DLYA DUSHA I DUSHI | Beauty sector | Health and wellness | <50 | 42 | 74597 |
| RIGA SOAP MANUFACTURE | Beauty sector | Health and wellness | <50 | 16 | 72796 |

```sql
-- UPDATE RENT RATES FROM ANCHORS DUE TO KNIGHT FRANKS ANALYSIS FRO 2011 --
update mega_sales ms set rent_sqm=4500
```

```sql
where tenant_name='Auchan';
update mega_sales ms  set rent_sqm=3000
where tenant_name='IKEA';

-- UPDATE COSMETICS SUBCATEGORY / SEPHORA --
SELECT
    tenant_name,
    category_sqm,
    leased_area,
    rent_sqm
FROM mega_sales tsv
WHERE subcategory = 'Cosmetics'
  AND category_sqm IN ('100<X<250', '250<X<500')
ORDER BY category_sqm, leased_area DESC;


SELECT ROUND(AVG(rent_sqm), 2) AS avg_rent_sqm_cosmetics
FROM mega_sales
WHERE subcategory = 'Cosmetics'
  AND category_sqm IN ('100<X<250', '250<X<500')
  AND rent_sqm IS NOT NULL
  AND rent_sqm > 0;
```

After updating all rental values, a comprehensive final check was performed to confirm the absence of any missing rent information, ensuring complete and accurate data integrity.

```sql
select tenant_name, rent_sqm from mega_sales ms
where rent_sqm is null or
rent_sqm =0;

update mega_sales tsv set rent_sqm=45000
where tenant_name ='sephora';
```

# Appendix 4.

**Initial Data Overview .**

The imported dataset (mega_sales) was first examined to understand its structure, completeness, and basic characteristics before proceeding to deeper analysis using the following queries:

- **Total number of tenants:** The dataset contains Y unique tenants across Z categories (query: COUNT(DISTINCT tenant_name) and GROUP BY category).

  ```sql
  SELECT
  COUNT(*) AS total_rows,
  COUNT(DISTINCT tenant_name) AS unique_tenants
  FROM mega_sales;
  ```

- **Review of duplicates:** No duplicates were found at the tenant_name level (HAVING COUNT(*) > 1 returned 0 rows), confirming that each tenant appears only once after initial import and cleaning.

```sql
        SELECT tenant_name, COUNT(*) as cnt
        FROM mega_sales
        GROUP BY tenant_name
        HAVING cnt > 1
        ORDER BY cnt DESC;
```

- **Number of categories, subcategories and categories sqm:**

```sql
        select count(distinct category) as total_categories from mega_sales ms; -
        13
        select count(distinct subcategory) as total_subcategories from mega_sales
        ms; - 51
        select count(distinct category_sqm) as total_category_sqm from mega_sales
        ms; 9
```

# Appendix 5.

Calculations of key business metrics.

```sql
-- 1 RENT PER YEAR --

alter table mega_sales add column rent_per_year decimal (18,2) null after
rent_sqm;
update mega_sales tsv set rent_per_year = leased_area * rent_sqm;

-- 2 TOTAL SALES FY 2010 --
alter table mega_sales add column sales_2010 decimal (18,2) null after
rent_per_year;
UPDATE mega_sales
SET
    sales_2010 = round(
        COALESCE(`2009-09-30`, 0) +
        COALESCE(`2009-10-31`, 0) +
        COALESCE(`2009-11-30`, 0) +
        COALESCE(`2009-12-31`, 0) +
        COALESCE(`2010-01-31`, 0) +
        COALESCE(`2010-02-28`, 0) +
        COALESCE(`2010-03-31`, 0) +
        COALESCE(`2010-04-30`, 0) +
        COALESCE(`2010-05-31`, 0) +
        COALESCE(`2010-06-30`, 0) +
        COALESCE(`2010-07-31`, 0) +
        COALESCE(`2010-08-31`, 0),0);

-- 3 TOTAL SALES FY 2011 --
alter table mega_sales
add column sales_2011 decimal (18,2) null after sales_2010;
update mega_sales tsv
set sales_2011 = round(
COALESCE(`2010-09-30`,0)+
COALESCE(`2010-10-31`,0)+
COALESCE(`2010-11-30`,0)+
COALESCE(`2010-12-31`,0)+
```

```sql
COALESCE(`2011-01-31`,0)+
COALESCE(`2011-02-28`,0)+
COALESCE(`2011-03-31`,0)+
COALESCE(`2011-04-30`,0)+
COALESCE(`2011-05-31`,0)+
COALESCE(`2011-06-30`,0)+
COALESCE(`2011-07-31`,0)+
COALESCE(`2011-08-31`,0),0);

-- 4 OCR FY 2010 --
alter table mega_sales add column ocr_2010 int null after sales_2010;
update mega_sales ms set ocr_2010 = rent_per_year / nullif (sales_2010,0) *100;

-- 5 OCR FY 2011 --
alter table mega_sales add column ocr_2011 int null after sales_2011;
update mega_sales ms set ocr_2011 = rent_per_year / nullif (sales_2011,0) *100;

-- 6 CHECK OCR IS ANOMALY HIGH 2010--
SELECT tenant_name, category, leased_area, rent_sqm, rent_per_year, ocr_2010,
sales_2010, start_date_tnr
FROM mega_sales ms
WHERE ocr_2010 > 20
ORDER by ocr_2010 desc;

SELECT tenant_name, category, leased_area, rent_sqm, rent_per_year, ocr_2011,
sales_2011, start_date_tnr
FROM mega_sales ms
WHERE ocr_2011 > 20
ORDER by ocr_2011 desc;

/* DURING THE OCR OBSERVATION 2 TENANTS - SUBANCHORS DETECTED AS OUTLIERS: COSMIK
AND DECATHLON
 WITH RENTS 147240 AND 137730 WICH IS OBVIOUSLY INCORRECT TAKING INTO
CONSIDERATION THE PREMISE SPACE OCCUPIED.
 CORRECTION OF RENTS IS IMPLEMENTED*/

SELECT tenant_name, category, leased_area, rent_sqm, rent_per_year, ocr_2010,
sales_2010, sales_2011, ocr_2011, start_date_tnr
FROM world.mega_sales
WHERE tenant_name= 'cosmik' or tenant_name ='decathlon';

update mega_sales tsv
set rent_sqm = 14724
where tenant_name='cosmik';
update mega_sales tsv
set rent_sqm=13473
where tenant_name='decathlon';

update mega_sales set rent_per_year = leased_area * rent_sqm
where tenant_name='Cosmik' or tenant_name='decathlon';

update mega_sales
set ocr_2010 = rent_per_year / nullif (sales_2010,0) *100
where tenant_name='Cosmik' or tenant_name='decathlon';
```

```sql
update mega_sales
set ocr_2011 = rent_per_year / nullif (sales_2011,0) *100
where tenant_name='Cosmik' or tenant_name='decathlon';

-- 7 NATURAL BREAKPOINT FOR TURNOVER --
alter table mega_sales add column natural_BP decimal (18,2) null after
rent_per_year;
update mega_sales set natural_BP=rent_per_year / (coalesce(tnr_perc)/100)
where tnr_perc is not null or tnr_perc !=0;

-- 8 TURNOVER FEE --
alter table mega_sales add column tnr_fee2010 decimal (18,2) null after ocr_2010,
add column tnr_fee2011 decimal (18,2) null after ocr_2011;
update mega_sales set
tnr_fee2010 =(sales_2010-Natural_BP)*tnr_perc/100
where sales_2010 > natural_BP;

update mega_sales set
tnr_fee2011 =(sales_2011-Natural_BP)*tnr_perc/100
where sales_2011 > natural_BP;
```

# Appendix 6.

**Creation of Aggregate Metrics.**

```sql
-- TOTAL OCCUPIED GLA --
select round(sum(leased_area),0) as GLA_info from mega_sales;

-- TOTAL SALES PER CATEGORY FY2010, FY 2011 --
select category, sum(sales_2010) as total_sales_2010, sum(sales_2011) as
total_sales_2011 from mega_sales ms
group by category
order by category asc;

-- TOTAL SALES PER SUBCATEGORY FY2010, FY 2011 --
select subcategory, sum(sales_2010) as total_sales_2010, sum(sales_2011) as
total_sales_2011 from mega_sales ms
group by subcategory
order by subcategory asc;

-- TOTAL SALES OVERALL --
select sum(sales_2010)as sales_fy2010, sum(sales_2011) as sales_fy2011,
(sum(sales_2010) + sum(sales_2011)) as total_sales_SC from mega_sales ms;

-- TOTAL FIXED RENT PER CATEGORY AND OVERALL --
select category, sum(rent_per_year) as rent_paid from mega_sales ms
group by category;

select sum(rent_per_year) as rent_SC from mega_sales ms;

-- TNR FEE FOR 2010, 2011 --
```

```sql
select sum(rent_per_year) as rent_SC, sum(tnr_fee2010) as variable_rent2010,
sum(tnr_fee2011) as variable_rent2011,
(sum(rent_per_year)+sum(tnr_fee2010)) as total_rent2010,
(sum(rent_per_year)+sum(tnr_fee2011)) as total_rent2011,
round(sum(tnr_fee2010)/sum(rent_per_year)*100,0) as rent_perc2010,
round(sum(tnr_fee2011)/sum(rent_per_year)*100,0) as rent_perc2011,
round(sum(rent_per_year)-sum(tnr_fee2010),0) as net_income2010,
round(sum(rent_per_year)-sum(tnr_fee2011),0) as net_income2011 from mega_sales
ms;

-- AVERAGE RENT PER SQM BY CATEGORY--
select category, round(avg(rent_sqm),0) as avg_rent, round(avg(leased_area),0) as
avg_leased_area, count(tenant_name) as number_of_tenants
from mega_sales ms
group by category
order by avg_rent desc;

select subcategory, category_sqm, round(avg(rent_sqm),0) as avg_rent,
round(avg(leased_area),0) as avg_leased_area, count(tenant_name) as
number_of_tenants
from mega_sales ms
group by subcategory, category_sqm
order by number_of_tenants desc;

-- CHECK AVG OR MIDDLE --
select tenant_name,category_sqm, rent_sqm from mega_sales ms
where subcategory= 'Family fashion'
order by category_sqm asc, rent_sqm asc;

-- MEDIAN RENT PER SQM BY SUBCATEGORY AND CATEGORY_ SQM --
WITH filtered AS (
    SELECT
      subcategory,
        Category_sqm,
        rent_sqm,
        ROW_NUMBER() OVER (PARTITION BY subcategory, Category_sqm ORDER BY
rent_sqm) AS rn,
        COUNT(*) OVER (PARTITION by subcategory, Category_sqm) AS cnt
    FROM mega_sales
    WHERE rent_sqm IS NOT NULL
)
SELECT
subcategory,
    Category_sqm,
    round(AVG(CASE
        WHEN rn IN (FLOOR((cnt + 1)/2), CEILING((cnt + 1)/2))
        THEN 1.0 * rent_sqm
        ELSE NULL
    END),0) AS median_rent_sqm,
        COUNT(*) AS tenant_count,
        round(AVG(rent_sqm),0) AS avg_rent_sqm,
    round(MIN(rent_sqm),0) AS min_rent_sqm,
    round(MAX(rent_sqm),0) AS max_rent_sqm
FROM filtered
GROUP BY subcategory,Category_sqm
```

```sql
ORDER BY tenant_count desc,
    CASE Category_sqm
        WHEN '<50'          THEN 1
        WHEN '50<X<100'     THEN 2
        WHEN '100<X<250'    THEN 3
        WHEN '250<X<500'    THEN 4
        WHEN '500<X<1000'   THEN 5
        WHEN '1000<X<2500'  THEN 6
        WHEN '2500<X<5000'  THEN 7
        ELSE 8
    end;

-- SALES DENSITY --
select subcategory,category_sqm, sum(leased_area) as leased_area,
/*sum(sales_2010) as sales2010, sum(sales_2011) as sales2011, */
round(sum(sales_2010)/ sum(leased_area),0) as sales_density2010,
round(sum(sales_2011)/ sum(leased_area),0) as sales_density2011
from mega_sales ms
group by subcategory, category_sqm
order by subcategory, category_sqm ;

-- OCR FY2010 --
create temporary table ocr_temp_table2010
SELECT
    tenant_name,
    category,
    leased_area,
    rent_per_year,
    rent_sqm,
    start_date_tnr,
    '2010-08-31' AS fy2010_end, GREATEST(COALESCE(start_date_tnr, '2009-09-
01'),'2009-09-01') AS effective_start_date,
        GREATEST(0, DATEDIFF('2010-08-31', GREATEST(COALESCE(start_date_tnr,
'2009-09-01'), '2009-09-01'))) AS days_active_in_fy2010,
        ROUND(rent_per_year * GREATEST(0, DATEDIFF('2010-08-31',
GREATEST(COALESCE(start_date_tnr, '2009-09-01'), '2009-09-01'))) / 365.0,
        2) AS adjusted_rent_fy2010, sales_2010 AS total_sales_fy2010,
        ROUND( CASE
            WHEN sales_2010 <= 0 OR sales_2010 IS NULL THEN NULL
            ELSE (rent_per_year * GREATEST(0, DATEDIFF('2010-08-31',
GREATEST(COALESCE(start_date_tnr, '2009-09-01'), '2009-09-01'))) / 365.0)
                / sales_2010 * 100
        END,2) AS adjusted_OCR_fy2010_percent
FROM mega_sales
WHERE sales_2010 IS NOT NULL
ORDER BY adjusted_OCR_fy2010_percent DESC;

select tenant_name, adjusted_OCR_fy2010_percent from ocr_temp_table2010
order by adjusted_OCR_fy2010_percent desc;

select tenant_name, ocr_2010, ocr_2011 from mega_sales ms
order by Ocr_2010 desc;

-- OCR FY2011 --
create temporary table ocr_temp_table2011
```

```sql
SELECT
    tenant_name,
    category,
    leased_area,
    rent_sqm,
    rent_per_year,
    start_date_tnr,
    '2011-08-31' AS fy2011_end,
        GREATEST(
        COALESCE(start_date_tnr, '2010-09-01'),
        '2010-09-01'
    ) AS effective_start_date,
        GREATEST(
        0,
        DATEDIFF('2011-08-31', GREATEST(COALESCE(start_date_tnr, '2010-09-01'),
'2010-09-01'))
    ) AS days_active_in_fy2011,
        ROUND(
        rent_per_year *
        GREATEST(0, DATEDIFF('2011-08-31', GREATEST(COALESCE(start_date_tnr,
'2010-09-01'), '2010-09-01'))) / 365.0,
        2
    ) AS adjusted_rent_fy2011,
        sales_2011 AS total_sales_fy2011,
    ROUND(
        CASE
            WHEN sales_2011 <= 0 OR sales_2011 IS NULL THEN NULL
            ELSE
                (rent_per_year * GREATEST(0, DATEDIFF('2011-08-31',
GREATEST(COALESCE(start_date_tnr, '2010-09-01'), '2010-09-01'))) / 365.0)
                / sales_2011 * 100
        END,
        2
    ) AS adjusted_OCR_fy2011_percent
FROM mega_sales
WHERE sales_2011 IS NOT NULL
ORDER BY adjusted_OCR_fy2011_percent DESC;

select * from ocr_temp_table2011;

-- AVERAGE TURNOVER PERCENT PER CATEGORIES, SUBCATEGORIES --
select category, category_sqm, count(tenant_name) as number_tenants,
round(avg(tnr_perc),0) as AVG_tnr_perc, min(tnr_perc) as min_tnr_perc,
max(tnr_perc) as max_tnr_perc
from mega_sales ms
group by category, category_sqm
order by number_tenants desc, avg_tnr_perc desc;

select subcategory, category_sqm, count(tenant_name) as number_tenants,
round(avg(tnr_perc),0) as AVG_tnr_perc, min(tnr_perc) as min_tnr_perc,
max(tnr_perc) as max_tnr_perc
from mega_sales ms
group by subcategory, category_sqm
order by max_tnr_perc desc; -- check if retail profile had 60% of tnr --
```

## Appendix 7.

```sql
-- GROSS TORNOVER PER MONTH BY SUBCATEGORY --
SELECT '2009-09' as month_sales, subcategory,
ROUND(SUM(`2009-09-30`),0) AS sales_res FROM mega_sales GROUP BY subcategory
UNION ALL
SELECT '2009-10', subcategory, round(SUM(`2009-10-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2009-11', subcategory, round(SUM(`2009-11-30`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2009-12', subcategory, round(SUM(`2009-12-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-01', subcategory, round(SUM(`2010-01-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-02', subcategory, round(SUM(`2010-02-28`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-03', subcategory, round(SUM(`2010-03-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-04', subcategory, round(SUM(`2010-04-30`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-05', subcategory, round(SUM(`2010-05-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-06', subcategory, round(SUM(`2010-06-30`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-07', subcategory, round(SUM(`2010-07-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-08', subcategory, round(SUM(`2010-08-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-09', subcategory, round(SUM(`2010-09-30`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-10', subcategory, round(SUM(`2010-10-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-11', subcategory, round(SUM(`2010-11-30`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-12', subcategory, round(SUM(`2010-12-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2011-01', subcategory, round(SUM(`2011-01-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2011-02', subcategory, round(SUM(`2011-02-28`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2011-03', subcategory, round(SUM(`2011-03-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2011-04', subcategory, round(SUM(`2011-04-30`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2011-05', subcategory, round(SUM(`2011-05-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2011-06', subcategory, round(SUM(`2011-06-30`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2011-07', subcategory, round(SUM(`2011-07-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2011-08', subcategory, round(SUM(`2011-08-31`),0) FROM mega_sales GROUP
BY subcategory
ORDER BY subcategory, month_sales;
```

```sql
-- AVERAGE TURNOVER PER MONTH BY SUBCATEGORY --
SELECT '2009-09' as month_sales, subcategory,
ROUND(AVG(`2009-09-30`),0) AS sales_res FROM mega_sales GROUP BY subcategory
UNION ALL
SELECT '2009-10', subcategory, round(AVG(`2009-10-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2009-11', subcategory, round(AVG(`2009-11-30`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2009-12', subcategory, round(AVG(`2009-12-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-01', subcategory, round(AVG(`2010-01-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-02', subcategory, round(AVG(`2010-02-28`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-03', subcategory, round(AVG(`2010-03-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-04', subcategory, round(AVG(`2010-04-30`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-05', subcategory, round(AVG(`2010-05-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-06', subcategory, round(AVG(`2010-06-30`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-07', subcategory, round(AVG(`2010-07-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-08', subcategory, round(AVG(`2010-08-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-09', subcategory, round(AVG(`2010-09-30`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-10', subcategory, round(AVG(`2010-10-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-11', subcategory, round(AVG(`2010-11-30`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2010-12', subcategory, round(AVG(`2010-12-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2011-01', subcategory, round(AVG(`2011-01-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2011-02', subcategory, round(AVG(`2011-02-28`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2011-03', subcategory, round(AVG(`2011-03-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2011-04', subcategory, round(AVG(`2011-04-30`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2011-05', subcategory, round(AVG(`2011-05-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2011-06', subcategory, round(AVG(`2011-06-30`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2011-07', subcategory, round(AVG(`2011-07-31`),0) FROM mega_sales GROUP
BY subcategory UNION ALL
SELECT '2011-08', subcategory, round(AVG(`2011-08-31`),0) FROM mega_sales GROUP
BY subcategory
ORDER BY subcategory, month_sales;


-- PERCENTAGE OF MONTHS WITH 0 SALES BY TENANT --
```

```sql
SELECT
    tenant_name,
    category,
    zero_months_count,
    ROUND(zero_months_count / 24.0 * 100, 1) AS zero_months_percent,
    start_date_tnr,
    end_date_tnr
FROM (
    SELECT *,
        (CASE WHEN `2009-09-30` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2009-10-31` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2009-11-30` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2009-12-31` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2010-01-31` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2010-02-28` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2010-03-31` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2010-04-30` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2010-05-31` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2010-06-30` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2010-07-31` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2010-08-31` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2010-09-30` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2010-10-31` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2010-11-30` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2010-12-31` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2011-01-31` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2011-02-28` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2011-03-31` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2011-04-30` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2011-05-31` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2011-06-30` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2011-07-31` IN (0,NULL) THEN 1 ELSE 0 END +
         CASE WHEN `2011-08-31` IN (0,NULL) THEN 1 ELSE 0 END) AS
zero_months_count
    FROM mega_sales
) AS t
WHERE zero_months_count > 0
ORDER BY zero_months_count DESC;
```

# Appendix 8.

```sql
-- RENT RANGE PER SUBCATEGORY AND CATEGORY_SQM --
create temporary table ranges_table as
SELECT subcategory, category_sqm, sum(leased_area) as total_leased_area,
count(tenant_name) as total_tenant,
round(avg(rent_sqm),0) AS avg_rent_sqm,
ROUND(MIN(rent_sqm), 0) as min_rent_sqm, ROUND(MAX(rent_sqm),0) as max_rent_sqm,
ROUND(MAX(rent_sqm),0) - ROUND(MIN(rent_sqm), 0) as rent_range
from mega_sales
GROUP BY subcategory, category_sqm
having total_tenant >1
order by subcategory, total_tenant desc, rent_range desc;
```

```sql
-- TENANTS WITH MIN AND MAX RENT BY SUBCATEGORY AND CATEGORY_SQM --
create temporary table  min_max_rents as
WITH ranked AS (
    SELECT
        subcategory,
        Category_sqm,
        tenant_name,
        leased_area,
        ocr_2010,
        ocr_2011,
        rent_sqm,
        ROW_NUMBER() OVER (PARTITION BY subcategory, Category_sqm ORDER BY
rent_sqm) AS rn_asc,
        ROW_NUMBER() OVER (PARTITION BY subcategory, Category_sqm ORDER BY
rent_sqm DESC) AS rn_desc
    FROM mega_sales
    WHERE rent_sqm IS NOT NULL
)
SELECT
    subcategory,
    Category_sqm,
    MAX(CASE WHEN rn_asc = 1 THEN tenant_name END) AS tenant_min_rent,
    MIN(CASE WHEN rn_asc = 1 THEN rent_sqm END) AS min_rent_sqm,
    MAX(CASE WHEN rn_asc = 1 THEN leased_area END) AS leased_area_min,
    MAX(CASE WHEN rn_asc = 1 THEN ocr_2010 END) AS ocr_2010_min,
    MAX(CASE WHEN rn_asc = 1 THEN ocr_2011 END) AS ocr_2011_min,
    MAX(CASE WHEN rn_desc = 1 THEN tenant_name END) AS tenant_max_rent,
    MAX(CASE WHEN rn_desc = 1 THEN rent_sqm END) AS max_rent_sqm,
    MAX(CASE WHEN rn_desc = 1 THEN leased_area END) AS leased_area_max,
    MAX(CASE WHEN rn_desc = 1 THEN ocr_2010 END) AS ocr_2010_max,
    MAX(CASE WHEN rn_desc = 1 THEN ocr_2011 END) AS ocr_2011_max,
    COUNT(*) AS total_tenants_in_group
FROM ranked
GROUP BY subcategory, Category_sqm
HAVING total_tenants_in_group >= 2
ORDER BY
    subcategory, total_tenants_in_group DESC,
    CASE Category_sqm
        WHEN '<50' THEN 1
        WHEN '50<X<100' THEN 2
        WHEN '100<X<250' THEN 3
        WHEN '250<X<500' THEN 4
        WHEN '500<X<1000' THEN 5
        WHEN '1000<X<2500' THEN 6
        WHEN '2500<X<5000' THEN 7
        ELSE 8
    END;

select * from min_max_rents; -- 67 lines --

select * from ranges_table; -- 67 lines --

create temporary table rents_ranges_temp as
SELECT
    m.*,
```

```sql
    m2.Total_leased_area,
    m2.avg_rent_sqm,
    m2.rent_range
    FROM min_max_rents m
LEFT JOIN ranges_table m2
    ON m.subcategory   = m2.subcategory
   AND m.category_sqm  = m2.category_sqm;

-- CREATING TEMPORARY / PERMANENT TABLES --
create table rents_ranges as
select * from rents_ranges_temp;
select * from rents_ranges rr;
```

**OCR ADJUSTMENTS**

```sql
-- CREATE OCR ADJUSTED TABLE 2010 --
create temporary table OCR_adj_2010_temp as
SELECT
    tenant_name,
    category,
    leased_area,
    rent_per_year,
    rent_sqm,
    start_date_tnr,
    '2010-08-31' AS fy2010_end, GREATEST(COALESCE(start_date_tnr, '2009-09-
01'),'2009-09-01') AS effective_start_date,
        GREATEST(0, DATEDIFF('2010-08-31', GREATEST(COALESCE(start_date_tnr,
'2009-09-01'), '2009-09-01'))) AS days_active_in_fy2010,
        ROUND(rent_per_year * GREATEST(0, DATEDIFF('2010-08-31',
GREATEST(COALESCE(start_date_tnr, '2009-09-01'), '2009-09-01'))) / 365.0,
        2) AS adjusted_rent_fy2010, sales_2010 AS total_sales_fy2010,
        ROUND( CASE
            WHEN sales_2010 <= 0 OR sales_2010 IS NULL THEN NULL
          ELSE (rent_per_year * GREATEST(0, DATEDIFF('2010-08-31',
GREATEST(COALESCE(start_date_tnr, '2009-09-01'), '2009-09-01'))) / 365.0)
              / sales_2010 * 100
        END,2) AS adjusted_OCR_fy2010_percent
FROM mega_sales
WHERE sales_2010 IS NOT NULL
ORDER BY adjusted_OCR_fy2010_percent DESC;

select * from OCR_adj_2010_temp;

-- CREATE OCR ADJUSTED TABLE 2011--
create temporary table OCR_adj_2011_temp as
SELECT
    tenant_name,
    category,
    leased_area,
    rent_sqm,
    rent_per_year,
    start_date_tnr,
    '2011-08-31' AS fy2011_end,
            GREATEST(
```

```sql
            COALESCE(start_date_tnr, '2010-09-01'),
            '2010-09-01'
        ) AS effective_start_date,
            GREATEST(
            0,
            DATEDIFF('2011-08-31', GREATEST(COALESCE(start_date_tnr, '2010-09-01'),
'2010-09-01'))
        ) AS days_active_in_fy2011,
            ROUND(
            rent_per_year *
            GREATEST(0, DATEDIFF('2011-08-31', GREATEST(COALESCE(start_date_tnr,
'2010-09-01'), '2010-09-01'))) / 365.0,
            2
        ) AS adjusted_rent_fy2011,
            sales_2011 AS total_sales_fy2011,
        ROUND(
            CASE
                WHEN sales_2011 <= 0 OR sales_2011 IS NULL THEN NULL
                ELSE
                    (rent_per_year * GREATEST(0, DATEDIFF('2011-08-31',
GREATEST(COALESCE(start_date_tnr, '2010-09-01'), '2010-09-01'))) / 365.0)
                    / sales_2011 * 100
            END,
            2
        ) AS adjusted_OCR_fy2011_percent
FROM mega_sales
WHERE sales_2011 IS NOT NULL
ORDER BY adjusted_OCR_fy2011_percent DESC;

select * from OCR_adj_2011_temp;

-- QUERY TO CREATE ocr_trend_temp TABLE TO SHOW THE FULL PICTURE OF OCR
ADJUSTMENTS --
create temporary table ocr_trend_temp as
SELECT DISTINCT
    tenant_name,
    category,
    ocr_2010_pct,
    ocr_2011_pct,
    ocr_trend_pct,
    trend_status,
    sales_2010,
    sales_2011,
    adjusted_rent_2010,
    adjusted_rent_2011
FROM (
    SELECT
        COALESCE(a.tenant_name, b.tenant_name) AS tenant_name,
        COALESCE(a.category, b.category) AS category,
        a.adjusted_OCR_fy2010_percent AS ocr_2010_pct,
        b.adjusted_OCR_fy2011_percent AS ocr_2011_pct,
        ROUND(
            COALESCE(b.adjusted_OCR_fy2011_percent, 0) -
COALESCE(a.adjusted_OCR_fy2010_percent, 0),
            2
```

```sql
            ) AS ocr_trend_pct,
            CASE
                WHEN COALESCE(a.adjusted_OCR_fy2010_percent, 0) = 0 THEN  -- Special
case: ocr_2010 = 0 or NULL
                    CASE
                        WHEN ROUND(COALESCE(b.adjusted_OCR_fy2011_percent, 0) -
COALESCE(a.adjusted_OCR_fy2010_percent, 0), 2) > 50
                            THEN 'High Startup Risk'
                        WHEN ROUND(COALESCE(b.adjusted_OCR_fy2011_percent, 0) -
COALESCE(a.adjusted_OCR_fy2010_percent, 0), 2) BETWEEN 0 AND 50
                            THEN 'Moderate Startup Phase'
                        WHEN ROUND(COALESCE(b.adjusted_OCR_fy2011_percent, 0) -
COALESCE(a.adjusted_OCR_fy2010_percent, 0), 2) < 0
                            THEN 'Improvement'
                        ELSE 'Stable'
                    END
                ELSE
                    CASE
                        WHEN ROUND(COALESCE(b.adjusted_OCR_fy2011_percent, 0) -
COALESCE(a.adjusted_OCR_fy2010_percent, 0), 2) > 100
                            THEN 'Critical Deterioration'
                        WHEN ROUND(COALESCE(b.adjusted_OCR_fy2011_percent, 0) -
COALESCE(a.adjusted_OCR_fy2010_percent, 0), 2) BETWEEN 50 AND 100
                            THEN 'Severe Deterioration'
                        WHEN ROUND(COALESCE(b.adjusted_OCR_fy2011_percent, 0) -
COALESCE(a.adjusted_OCR_fy2010_percent, 0), 2) BETWEEN 0 AND 50
                            THEN 'Moderate Concern'
                        WHEN ROUND(COALESCE(b.adjusted_OCR_fy2011_percent, 0) -
COALESCE(a.adjusted_OCR_fy2010_percent, 0), 2) < 0
                            THEN 'Improvement'
                        ELSE 'Stable'
                    END
            END AS trend_status,
            a.total_sales_fy2010 AS sales_2010,
            b.total_sales_fy2011 AS sales_2011,
            a.adjusted_rent_fy2010 AS adjusted_rent_2010,
            b.adjusted_rent_fy2011 AS adjusted_rent_2011
    FROM OCR_adj_2010_temp a
    LEFT JOIN ocr_adj_2011_temp b ON a.tenant_name = b.tenant_name
) t
ORDER BY ocr_trend_pct DESC;

select * from ocr trend temp;

-- TURNOVER TENANTS --
select* from mega_sales ms;
-- CREATE TEMP TABLE TNR 2010--
create temporary table temp_tnr_2010 as
select tenant_name,
category,
subcategory,
category_sqm,
tnr_perc,
start_date_tnr,
end_date_tnr,
```

```sql
leased_area,
build_phase,
rent_sqm,
rent_per_year,
natural_bp,
sales_2010,
OCR_2010,
tnr_fee2010 from mega_sales
where tnr_fee2010 !=0 or tnr_fee2010 is not null;
select * from temp_tnr_2010;

/* create table tnr_2010 as select * from temp_tnr_2010;
select * from tnr_2010 t;

--ADDING THE MISSING COLUMN --
alter table tnr_2010 add column total_rent2010 decimal(18,2) null after
tnr_fee2010;
update tnr_2010 set
total_rent2010 = rent_per_year + tnr_fee2010;*/

-- CREATE TEMP TABLE TNR 2011--
create temporary table temp_tnr_2011 as
select tenant_name,
category,
subcategory,
category_sqm,
tnr_perc,
start_date_tnr,
end_date_tnr,
leased_area,
build_phase,
rent_sqm,
rent_per_year,
natural_bp,
sales_2011,
OCR_2011,
tnr_fee2011 from mega_sales
where tnr_fee2011 !=0 or tnr_fee2011 is not null;

/* select * from temp_tnr_2011;
create table tnr_2011 as select * from temp_tnr_2011;
select * from tnr_2011;

-- ADDING THE MISSING COLUMN --
alter table tnr_2011 add column total_rent2011 decimal(18,2) null after
tnr_fee2011;
update tnr_2011 set
total_rent2011 = rent_per_year + tnr_fee2011;*/

create temporary table tenants_tnr_table as SELECT
    COALESCE(t.tenant_name, t2.tenant_name) AS tenant_name,
    COALESCE(t.category, t2.category) AS category,
    COALESCE(t.leased_area, t2.leased_area) AS leased_area,
    COALESCE(t.build_phase, t2.build_phase) as build_phase,
    COALESCE(t.rent_sqm, t2.rent_sqm) as rent_sqm,
```

```sql
    coalesce(t.tnr_perc, t2.tnr_perc) as tnr_percent,
    coalesce(t.rent_per_year, t2.rent_per_year) as rent_per_year,
    t.sales_2010,
    t2.sales_2011,
    OCR_2010,
    OCR_2011,
    t.total_rent2010,
    total_rent2011
FROM tnr_2010 t
LEFT JOIN tnr_2011 t2 ON t.tenant_name = t2.tenant_name
UNION
SELECT
    COALESCE(t.tenant_name, t2.tenant_name) AS tenant_name,
    COALESCE(t.category, t2.category) AS category,
    COALESCE(t.leased_area, t2.leased_area) AS leased_area,
    COALESCE(t.build_phase, t2.build_phase) as build_phase,
    COALESCE(t.rent_sqm, t2.rent_sqm) as rent_sqm,
    coalesce(t.tnr_perc, t2.tnr_perc) as tnr_percent,
    coalesce(t.rent_per_year, t2.rent_per_year) as rent_per_year,
    sales_2010,
    sales_2011,
    OCR_2010,
    OCR_2011,
    total_rent2010,
    t2.total_rent2011
FROM tnr_2010 t
RIGHT JOIN tnr_2011 t2 ON t.tenant_name = t2.tenant_name
WHERE t.tenant_name IS null
order by tenant_name;

select * from tenants_tnr_table;

-- QUERY --
create temporary table tnr_stat_table as
SELECT
    SUM(CASE WHEN COALESCE(sales_2010, 0) > 0 THEN rent_per_year ELSE 0 END) AS
total_fixed_rent_2010,
    SUM(CASE WHEN COALESCE(sales_2011, 0) > 0 THEN rent_per_year ELSE 0 END) AS
total_fixed_rent_2011,
    SUM(COALESCE(total_rent2010, 0)) AS total_tnr_2010,
    SUM(COALESCE(total_rent2011, 0)) AS total_tnr_2011,
    SUM(CASE WHEN COALESCE(sales_2010, 0) > 0 THEN COALESCE(total_rent2010, 0)
ELSE 0 END)
      - SUM(CASE WHEN COALESCE(sales_2010, 0) > 0 THEN rent_per_year ELSE 0 END)
AS income_2010,
        SUM(CASE WHEN COALESCE(sales_2011, 0) > 0 THEN COALESCE(total_rent2011, 0)
ELSE 0 END)
      - SUM(CASE WHEN COALESCE(sales_2011, 0) > 0 THEN rent_per_year ELSE 0 END)
AS income_2011,
        ROUND(
        CASE
            WHEN SUM(CASE WHEN COALESCE(sales_2010, 0) > 0 THEN rent_per_year
ELSE 0 END) = 0 THEN NULL
            ELSE
```

```sql
                    (SUM(CASE WHEN COALESCE(sales_2010, 0) > 0 THEN
COALESCE(total_rent2010, 0) ELSE 0 END)
                        - SUM(CASE WHEN COALESCE(sales_2010, 0) > 0 THEN rent_per_year
ELSE 0 END)) * 100.0
                        / SUM(CASE WHEN COALESCE(sales_2010, 0) > 0 THEN rent_per_year
ELSE 0 END)
            END,
            2
    ) AS income2010_perc,
            ROUND(
            CASE
                WHEN SUM(CASE WHEN COALESCE(sales_2011, 0) > 0 THEN rent_per_year
ELSE 0 END) = 0 THEN NULL
                ELSE
                    (SUM(CASE WHEN COALESCE(sales_2011, 0) > 0 THEN
COALESCE(total_rent2011, 0) ELSE 0 END)
                        - SUM(CASE WHEN COALESCE(sales_2011, 0) > 0 THEN rent_per_year
ELSE 0 END)) * 100.0
                        / SUM(CASE WHEN COALESCE(sales_2011, 0) > 0 THEN rent_per_year
ELSE 0 END)
            END,
            2
    ) AS income2011_perc,
        -- Turnover Share = income / total_tnr_XXXX × 100 (это даёт 55.57 и
61.64)
    ROUND(
        CASE
            WHEN SUM(COALESCE(total_rent2010, 0)) = 0 THEN NULL
            ELSE
                (SUM(CASE WHEN COALESCE(sales_2010, 0) > 0 THEN
COALESCE(total_rent2010, 0) ELSE 0 END)
                    - SUM(CASE WHEN COALESCE(sales_2010, 0) > 0 THEN rent_per_year
ELSE 0 END))
                * 100.0
                / SUM(COALESCE(total_rent2010, 0))
        END,
        2
    ) AS turnover_share_total_rent_2010,
        ROUND(
        CASE
            WHEN SUM(COALESCE(total_rent2011, 0)) = 0 THEN NULL
            ELSE
                (SUM(CASE WHEN COALESCE(sales_2011, 0) > 0 THEN
COALESCE(total_rent2011, 0) ELSE 0 END)
                    - SUM(CASE WHEN COALESCE(sales_2011, 0) > 0 THEN rent_per_year
ELSE 0 END))
                * 100.0
                / SUM(COALESCE(total_rent2011, 0))
        END,
        2
    ) AS turnover_share_total_rent_2011
FROM tenants_tnr_table;

create table tnr_stat as select * from tnr_stat_table;
select* from tnr_stat ts;
```