

Insurance Product Performance Analytics Platform

Requirement

Source Data Format (Raw):

- **Policy Premium Data Layout**

Column Name	Data Type	Description
POLICY	VARCHAR(20)	Unique policy identifier
INSURED NAME	VARCHAR(100)	Name of the insured entity
BROKER NAME	VARCHAR(100)	Name of the insurance broker
EFFECTIVE DATE	DATE	Policy effective (start) date
EXPIRATION DATE	DATE	Policy expiration (end) date
TRAN DATE	DATE	Transaction date
CXL TRAN	VARCHAR(5)	Indicates if the transaction is a cancellation (yes/no)
RISK STATE	CHAR(2)	State where the risk is located
GARAGING ZIP	VARCHAR(10)	Garaging ZIP code
BUSINESS EXPERIENCE	VARCHAR(50)	Business description or class
UNDERWRITER	VARCHAR(50)	Underwriter name
POLICY LIMIT	DECIMAL(12,2)	Policy limit amount
ORIGINAL UNIT COUNT	INT	Original unit count
ORIGINAL DRIVER COUNT	INT	Original driver count
CURRENT UNIT COUNT	INT	Current unit count
CURRENT DRIVER COUNT	INT	Current driver count
DEDUCTIBLE	DECIMAL(10,2)	Deductible amount
ORIGINAL BASE RATE	DECIMAL(10,2)	Original base rate
ADJUSTED BASE RATE	DECIMAL(10,2)	Adjusted base rate
GROSS POLICY PREMIUM	DECIMAL(10,2)	Gross policy premium
ORIGINAL PPU	DECIMAL(10,2)	Original policy premium unit
TOTAL TRANSACTION PREMIUM	DECIMAL(10,2)	Total transaction premium
TOTAL RUNNING PREMIUM	DECIMAL(10,2)	Total running premium
ENDORSEMENT NUMBER	INT	Endorsement number (unique per policy)

- **Claims Data Layout**

Column Name	Data Type	Description
CLAIM_NUMBER	VARCHAR(20)	Unique identifier for the claim
POLICY	VARCHAR(20)	Policy number associated with the claim
RISK_STATE	CHAR(2)	State where the risk occurred
DATE_OF_LOSS	DATE	Date when the loss occurred
NOTICE_DATE	DATE	Date when the claim was reported
AMOUNT	DECIMAL(12,2)	Amount of the claim (in dollars)
DATE	DATE	Date of the claim transaction
COMPANY	VARCHAR(50)	Insurance company handling the claim
TYPE	VARCHAR(30)	Type of claim transaction
COVERAGE	VARCHAR(100)	Coverage details
ACCIDENT_STATE	CHAR(2)	State where the accident occurred
ACCIDENT_COMMENTS	VARCHAR(255)	Comments or description of the accident

- Primary Keys for Premium Data: Policy + Endorsement Number
- Primary Keys for Claims Data: Claim_Number + Date + Amount + Type + Coverage

Data Quality Requirements:

- **Policy Premium Data Quality Requirements**

Field Name	Data Quality Rules	Data Cleansing Defaults
policy	Can't be null	Reject Record
insured_name	Can't be null	Reject Record
broker_name	Can't be null	Reject Record
effective_date	Valid Date format and Not Null	Reject Record
expiration_date	Valid Date format and Not Null	Reject Record
tran_date	Valid Date format and Not Null	Reject Record
cxl_tran	Check for 'yes' or 'no'	Reject Record
risk_state	Check for valid state code	Reject Record
garaging_zip	No DQ Rule	Reject Record

business_experience	Can't be null	Reject Record
Underwriter	Can't be null	Reject Record
policy_limit	Check for valid numeric	Reject Record
original_unit_count	Check for valid numeric	Reject Record
original_driver_count	Check for valid numeric	Reject Record
current_unit_count	Check for valid numeric	Reject Record
current_driver_count	Check for valid numeric	Reject Record
deductible	Check for valid numeric	Reject Record
original_base_rate	Check for valid numeric	Reject Record
adjusted_base_rate	Check for valid numeric	Reject Record
gross_policy_premium	Check for valid numeric	Reject Record
original_ppu	Check for valid numeric	Reject Record
total_transaction_premium	Check for valid numeric	Reject Record
total_running_premium	Check for valid numeric	Reject Record
endorsement_number	Check for valid numeric	Reject Record

- **Claims Data Quality Requirements**

Field Name	Data Quality Rules	Data Cleansing Defaults
claim_number	Can't be null	Reject Record
policy	Can't be null	Reject Record
risk_state	Can't be null	Reject Record
date_of_loss	Valid Date format and Not Null	Reject Record
notice_date	Valid Date format and Not Null	Reject Record
amount	Can't be null	Covert into Currency
date	Valid Date format and Not Null	Reject Record
company	Can't be null	Reject Record
type	Can't be null	Reject Record
coverage	Can't be null	Reject Record
accident_state	Can't be null	Reject Record
accident_comments	No DQ Rule	

Derived Data Format with Transformations

- **Premium Data Format (Derived)**

Field Name	Database Constraint	Transformations
POLICY	Primary Key	Unique Key
INSURED NAME		
BROKER NAME		
EFFECTIVE DATE		
EXPIRATION DATE		
TRAN DATE		
CXL TRAN		
RISK STATE		
GARAGING ZIP		
BUSINESS EXPERIENCE		
UNDERWRITER		
POLICY LIMIT		
ORIGINAL UNIT COUNT		
ORIGINAL DRIVER COUNT		
CURRENT UNIT COUNT		
CURRENT DRIVER COUNT		
DEDUCTIBLE		
ORIGINAL BASE RATE		
ADJUSTED BASE RATE		
GROSS POLICY PREMIUM		
ORIGINAL PPU		
TOTAL TRANSACTION PREMIUM		
TOTAL RUNNING PREMIUM		
ENDORSEMENT NUMBER		
policy Year	Dervied Fields	Year of effective_date
written_policy_premium	Dervied Fields	Sum of total_transaction_premium
exposure_unit_years	Dervied Fields	<p>""Calculate the exposure_unit_years for all records for a policy using below formula: For endorsement_number from '1' record</p> <p>exposure_unit_years =</p> <p>[current_unit_count*[(transaction_date(1)-effective_date(0))]/366 for leap year or 365.</p>

		<p>For endorsement_number from '2' to Max-1 record exposure_unit_years = $\frac{[current_unit_count * [(transaction_date(2) - transaction_date(1))]}{366}$ for leap year or 365.</p> <p>For Max(endt_history_seq_num) for a policy exposure_unit_years = $\frac{[current_unit_count * [(expiration_date(max) - transaction_date(max))]}{366}$ for leap year or 365. ""</p>
earned_policy_premium		<p>"If current date is within expiry date</p> <p>Sum of all earned policy premium = $(total_transaction_premium * (Current\ Date - effective_date) / 366)$ (for leap year) or 365 (for non-leap year) for endorsement number ""0"" and $(total_transaction_premium * (Current\ Date - effective_date) / 366)$ (for leap year) or 365 (for non-leap year) for rest of endorsement.</p>
		<p>If current date is greater than expiry date</p> <p>Sum of all earned policy premium = $(total_transaction_premium * (expiry_date - effective_date) \text{ in days} / 366)$ (for leap year) or 365 (for non-leap year) for each endorsement. "</p>
price_per_exposure_unit	Dervied Fields	written_policy_premium /exposure_unit_years
max_driver_count	Dervied Fields	Max value of current_driver_count across all endorsements for apolicy
max_unit_count	Dervied Fields	Max value of current_unit_count across all endorsements for apolicy
unit_rank	Dervied Fields	Use exposure_unit_years to get unit_rank from master table
unit_range	Dervied Fields	Use exposure_unit_years to get unit_range from master table

Unit_Range_Master			
Unit_Rank	Unit_Min	Unit_Max	Unit_Range

1	1	1.49	1
2	1.5	4.49	2-4
3	4.5	7.49	5-7
4	7.5	10.49	8-10
5	10.5	15.49	11-15
6	15.5	20.49	16-20
7	20.5	25.49	21-25
8	25.5	30.49	26-30
9	30.5	40.49	31-40
10	40.5	50.49	41-50
11	50.5	99999	51+

- **Claims Data Format (Derived)**

Field Name	Database Constraint	Transformations
claim_number	Primary Key	
policy	Foreign Key	
risk_state		
date_of_loss		
notice_date		
company		
accident_state		
notes		
accident_comments		
incurred_loss	Derived Field	Sum of all Amount of all claims with same claim_number with type ""START-LOSS-RSV"" or ""RSV-LOSS-CHG"" or ""START-EXP-RSV"" or ""RSV-EXP-CHG"

Curated Combined Data Format

Field Name	Database Constraint
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policy_number	Composite Key
insured_name	
broker_name	
effective_date	
expiration_date	
risk_state	
garaging_zip	
business_experience	
handler	
policy Year	
written_policy_premium	
exposure_unit_years	
earned_policy_premium	
price_per_exposure_unit	
unit_rank	
unit_range	
claim_number	Composite Key
incurred_loss	
incurred_loss_ratio	Derived Field
cargo_deductible	
max_driver_count	
max_unit_count	

Summaried Data Format for Dashboard Creation

Summaried_MTC_Loss_Ratio_By_Year		
Field Name	Data Range	Transformation
unit_range	1; 2-4; 5-7;8-10;11-15;16-20;21-25;26-30;31-40;41-50;51+	Data Range as rows

policy_year	All Years per unit range	MTC_Premium_Claims_Curated_Data
policy_count	count of policy_number	MTC_Premium_Claims_Curated_Data
written_policy_premium	Summary on policy_year & unit_range	MTC_Premium_Claims_Curated_Data
exposure_unit_years		MTC_Premium_Claims_Curated_Data
earned_policy_premium		MTC_Premium_Claims_Curated_Data
price_per_exposure_unit		MTC_Premium_Claims_Curated_Data
incurred_loss_ratio		MTC_Premium_Claims_Curated_Data
yoy-diff_percentage	Derived	price_per_exposure_unit (current_year - last_year)/last_year

Summaried_MTC_Loss_Ratio_By_Insured		
Field Name	Data Range	Transformation
insured_name		List of all insured_names
policy_year	All Years per unit range	MTC_Premium_Claims_Curated_Data
policy_count	count of policy_number	MTC_Premium_Claims_Curated_Data
written_policy_premium	Summary on policy_year	MTC_Premium_Claims_Curated_Data
exposure_unit_years		MTC_Premium_Claims_Curated_Data
earned_policy_premium		MTC_Premium_Claims_Curated_Data
price_per_exposure_unit		MTC_Premium_Claims_Curated_Data
incurred_loss_ratio		MTC_Premium_Claims_Curated_Data
avg_cargo_deductible	avg across all polices for the year using cargo_deductible	
max_driver_count (Max)		MTC_Corban_Premium_Curated_Data
max_unit_count (Max)		MTC_Corban_Premium_Curated_Data

Summaried_MTC_Loss_Ratio_By_Business_Experience		
Field Name	Data Range	Transformation
	NEW VENTURE 1 TO 2 YEARS 2 TO 3 YEARS 3+ YEARS	
policy_year	All Years per unit range	MTC_Premium_Claims_Curated_Data
policy_count	count of policy_number	MTC_Premium_Claims_Curated_Data
written_policy_premium	Summary on policy_year	MTC_Premium_Claims_Curated_Data
exposure_unit_years		MTC_Premium_Claims_Curated_Data
earned_policy_premium		MTC_Premium_Claims_Curated_Data

price_per_exposure_unit		MTC_Premium_Claims_Curated_Data
incurred_loss_ratio		MTC_Premium_Claims_Curated_Data
avg_cargo_deductible	avg across all policies for the year using cargo_deductible	
max_driver_count (Sum)		MTC_Corban_Premium_Curated_Data
max_unit_count (Sum)		MTC_Corban_Premium_Curated_Data

Summaried_MTC_Loss_Ratio_By_Brokers		
Field Name	Data Range	Transformation
broker_name	List all broker names	List all broker names
policy_year	All Years per unit range	MTC_Premium_Claims_Curated_Data
policy_count	count of policy_number	MTC_Premium_Claims_Curated_Data
written_policy_premium	Summary on policy_year	MTC_Premium_Claims_Curated_Data
exposure_unit_years		MTC_Premium_Claims_Curated_Data
earned_policy_premium		MTC_Premium_Claims_Curated_Data
price_per_exposure_unit		MTC_Premium_Claims_Curated_Data
incurred_loss_ratio		MTC_Premium_Claims_Curated_Data
avg_cargo_deductible	avg across all policies for the year using cargo_deductible	
max_driver_count (Sum)		MTC_Corban_Premium_Curated_Data
max_unit_count (Sum)		MTC_Corban_Premium_Curated_Data

Summaried_MTC_Loss_Ratio_By_UW		
Field Name	Data Range	Transformation
underwriter_name	List all handler names	List all handler names
policy_year	All Years per unit range	MTC_Premium_Claims_Curated_Data
policy_count	count of policy_number	MTC_Premium_Claims_Curated_Data
written_policy_premium	Summary on policy_year	MTC_Premium_Claims_Curated_Data
exposure_unit_years		MTC_Premium_Claims_Curated_Data
earned_policy_premium		MTC_Premium_Claims_Curated_Data
price_per_exposure_unit		MTC_Premium_Claims_Curated_Data
incurred_loss_ratio		MTC_Premium_Claims_Curated_Data
avg_cargo_deductible	avg across all policies for the year using cargo_deductible	
max_driver_count (Sum)		MTC_Corban_Premium_Curated_Data
max_unit_count (Sum)		MTC_Corban_Premium_Curated_Data

Summaried_MTC_Loss_Ratio_By_State		
Field Name	Data Range	Transformation
risk_state	List all state names	List all state names
policy_year	All Years per unit range	MTC_Premium_Claims_Curated_Data
policy_count	count of policy_number	MTC_Premium_Claims_Curated_Data
written_policy_premium	Summary on policy_year	MTC_Premium_Claims_Curated_Data
exposure_unit_years		MTC_Premium_Claims_Curated_Data
earned_policy_premium		MTC_Premium_Claims_Curated_Data
price_per_exposure_unit		MTC_Premium_Claims_Curated_Data
incurred_loss_ratio		MTC_Premium_Claims_Curated_Data
avg_cargo_deductible	avg across all polices for the year using cargo_deductible	
max_driver_count (Sum)		MTC_Corban_Premium_Curated_Data
max_unit_count (Sum)		MTC_Corban_Premium_Curated_Data

Sample Dashboards:

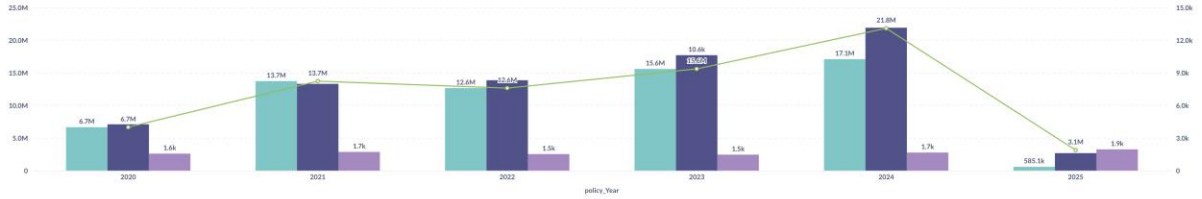
MTC Loss Ratio Dashboard

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Unit Range: 11-15 Business Exp: Broker Name: Insured Name: Underwriter Name: Risk State: Wholesaler NTA

MTC Premium to Incurred Loss to Price per Unit Chart

total_written_policy_premium total_earned_policy_premium total_exposure_unit_years avg_price_per_exposure_unit



MTC Yearly Summary Report

Policy Year	Policy Count	Written Policy Premium (\$)	Exposure Unit Years	Earned Policy Premium (\$)	Incurred Loss (\$)	Loss Ratio	Price Per Exposure Unit (\$)	YoY Difference
2020	938	\$6,653,048.00	4,258.82	\$6,653,048.00	\$0	0.00%	\$1,562.38	-
2021	2,170	\$13,711,292.00	7,976.81	\$13,711,292.00	\$0	0.00%	\$1,718.89	10.03%
2022	1,804	\$12,642,607.00	8,309.41	\$12,642,607.00	\$0	0.00%	\$1,521.48	-11.48%
2023	1,970	\$15,583,828.00	10,612.05	\$15,583,828.00	\$0	0.00%	\$1,468.50	-3.48%
2024	2,025	\$17,061,427.00	12,137.8	\$17,061,427.00	\$0	0.00%	\$1,659.82	12.03%
2025	371	\$1,443,935.00	1,608.73	\$1,443,935.00	\$585.1k	0.00%	\$1,954.30	17.74%
Total	10,278	\$73,541,147.00	45,903.62	\$66,257,672.60	\$0	0.00%	\$1,602.08	-

MTC Loss Ratio Dashboard

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Unit Range: Business Exp: NEW VENTURE Broker Name: Insured Name: Underwriter Name: Risk State: Wholesaler NTA

MTC Business Exp Summary Report

Business Experience	Policy Count	Avg Cargo Deductible (\$)	Written Policy Premium (\$)	Exposure Unit Years	Earned Policy Premium (\$)	Max Unit Count	Max Driver Count	Incurred Loss (\$)	Loss Ratio	Price Per Exposure Unit (\$)
3+ YEARS	4,184	\$2,424.00	\$47,013,488.00	31,410.62	\$41,251,252.03	35,181	45,873	\$0	0.00%	\$1,496.74
1 TO 2 YEARS	1,995	\$2,221.00	\$9,460,179.00	5,224.13	\$8,995,245.62	6,353	8,987	\$0	0.00%	\$1,810.86
2 TO 3 YEARS	1,424	\$2,306.00	\$8,518,093.00	5,014.51	\$7,748,854.76	5,909	8,700	\$0	0.00%	\$1,698.69
NEW VENTURE	2,673	\$2,201.00	\$8,508,617.00	4,233.08	\$8,219,550.19	5,129	6,611	\$0	0.00%	\$2,010.03
0	2	\$2,500.00	\$40,770.00	21.28	\$40,770.00	23	39	\$0	0.00%	\$1,915.88
TOTAL	10,278	\$2,332.00	\$73,541,147.00	45,903.62	\$66,257,672.60	52,595	70,230	\$0	0.00%	\$1,602.08

MTC Business Exp Detail Report

Business Experience	Policy Year	Policy Count	Written Policy Premium (\$)	Earned Policy Premium (\$)	Max Unit Count	Max Driver Count	Incurred Loss (\$)	Exposure Unit Years	Loss Ratio	Price Per Exposure Unit (\$)	YoY Change	Avg Cargo Deductible (\$)
NEW VENTURE	2020	438	\$1,487,462.00	\$1,487,462.00	1,063	1,247	\$0	814.34	0.000000%	\$1,826.59	-	\$1,342.00
NEW VENTURE	2021	991	\$3,130,124.00	\$3,130,126.00	1,863	2,291	\$0	1,527.15	0.000000%	\$2,049.65	12.210000%	\$2,193.00
NEW VENTURE	2022	423	\$1,320,044.00	\$1,320,044.00	733	1,032	\$0	641.85	0.000000%	\$2,056.62	0.340000%	\$2,515.00
NEW VENTURE	2023	405	\$1,171,636.00	\$1,173,636.00	713	1,065	\$0	598.96	0.000000%	\$1,962.80	-4.360000%	\$2,517.00
NEW VENTURE	2024	385	\$1,322,854.00	\$1,092,330.15	723	937	\$0	617.01	0.000000%	\$2,143.97	9.230000%	\$2,986.00
NEW VENTURE	2025	31	\$72,495.00	\$14,052.04	34	39	\$0	33.77	0.000000%	\$2,146.73	0.130000%	\$2,508.00
Total	-	2,673	\$8,508,617.00	\$8,219,550.19	5,129	6,611	\$0	4,233.08	0.000000%	\$2,010.03	-	\$2,201.00