

Society of Indian Automobile Manufacturers

"9th Looking Ahead Conclave - Preparing for Turnaround"

Forecast of Automobiles Industry in FY16

11th January 2015

New Delhi



ICRA Management Consulting Services Limited



Agenda

Macro -economic Environment

Sectoral Trends

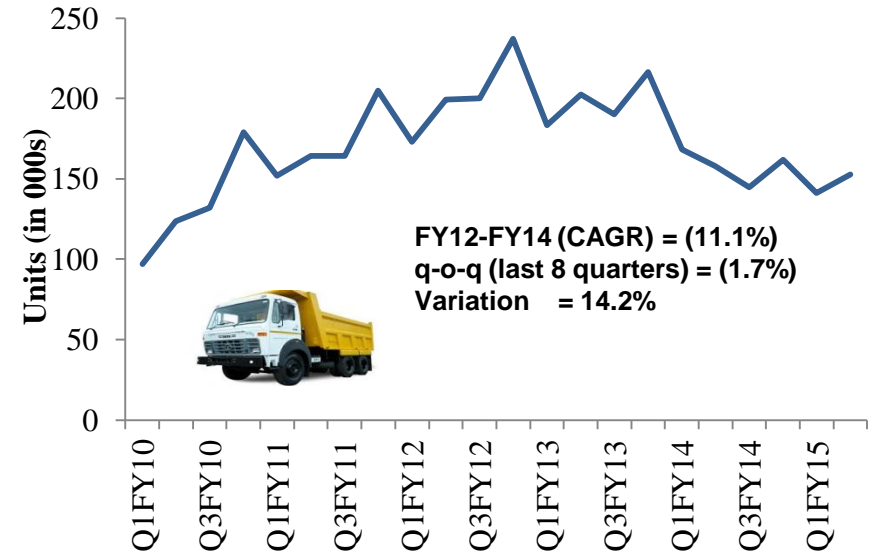
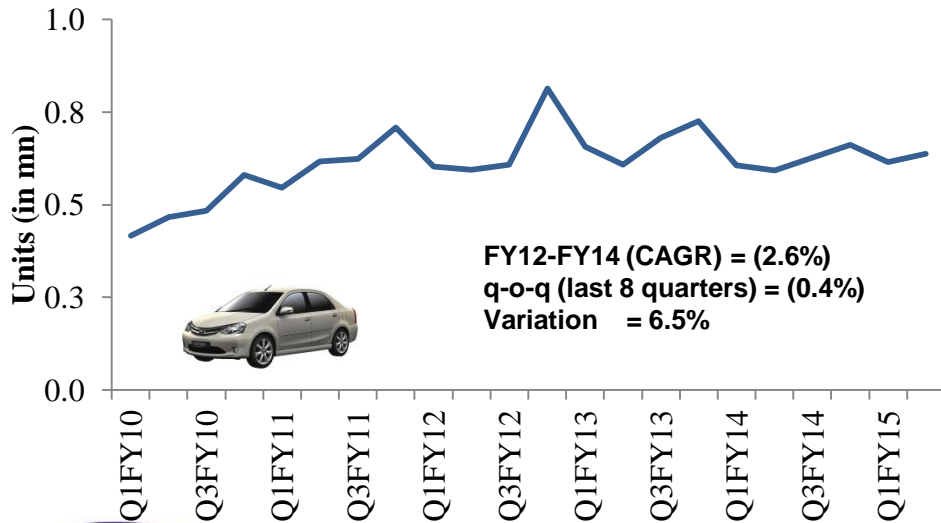
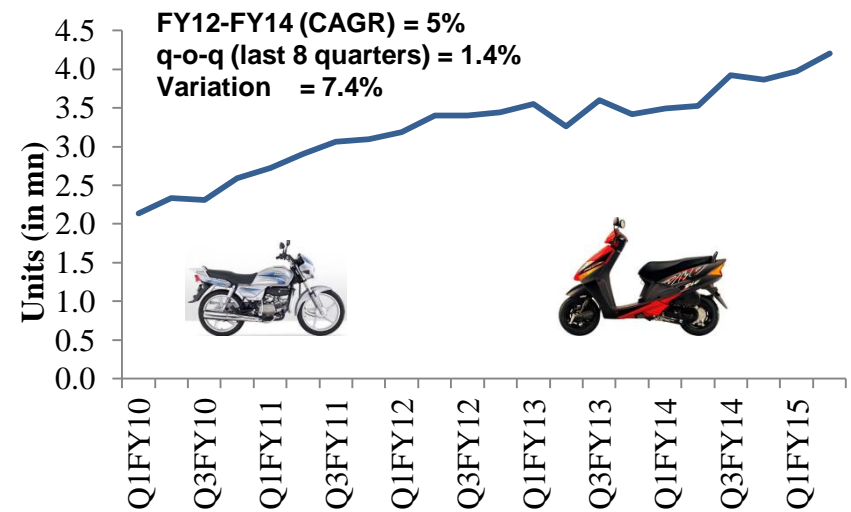
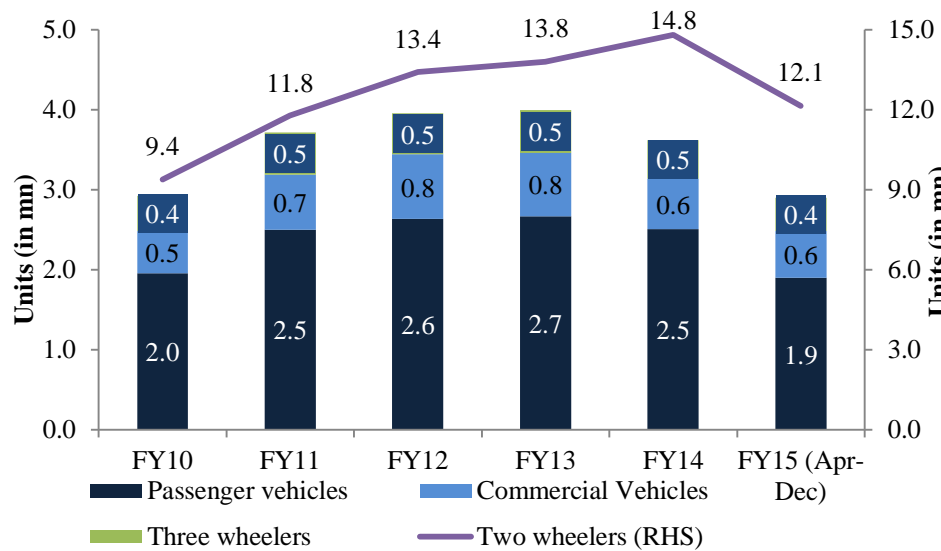
Industry Outlook for FY16

Economic slowdown had a negative impact on Indian Auto Sector

Parameter	FY06- FY11	FY12- FY14
GDP Growth (%)	8.6	5.3
Manufacturing GDP growth (%)	9.1	2.6
Growth in Gross Fixed Capital Formation (GFCF) (%)	11.4	4.3
Average Inflation rate (%)	6.2	7.4
INR vs. US\$ (Rs./US\$)	44.8	54.2
Annual average crude oil prices (US\$/barrel)	72.3	90.1
CAGR growth in production (%)		
Passenger Vehicles (PV)	17.9	(1.2)
Commercial Vehicles (CV)	14.2	(13.3)
Two Wheelers (2W)	11.9	4.6
Three Wheelers (3W)	13.0	(2.8)
Automotive Components	16.5	(3.6)

- **Adverse impact on consumer sentiment**
- **Increase in cost of ownership – due to high fuel prices, interest rates**

Domestic Sales Trends over past five years



Three tier analytical framework of IMaCS' demand forecasting model

Model Components

Causal Parts

1A) Causal Econometric model

1B) Preference shifts - that cause spikes in sales (e.g. new launches)

1C) Exogenous Impetus - e.g. excise cut.

Non-Causal Part

2) Time series components:

- Cyclic component - business cycles
- Seasonal component - seasonal aberrations across every 12 month cycle
- Random Part - Correction

- Univariate Analysis - economic, industrial and other factors
- Zero order correlation
- Model / Segment specific demand functional forms
- Forecast / In sample back testing
- Substitution model across categories
 - ✓ Price
 - ✓ Non-price

- ARIMA & VaR methods

Adaptive Adjustment Module

3) Adaptive adjustment to forecasts - based upon Primary survey – OEMs, dealers on pent up demand, stock position, discounts, model/ variants discontinuities –M-M basis

Consistency check for feedback recd. from OEMs, dealers using statistical methods

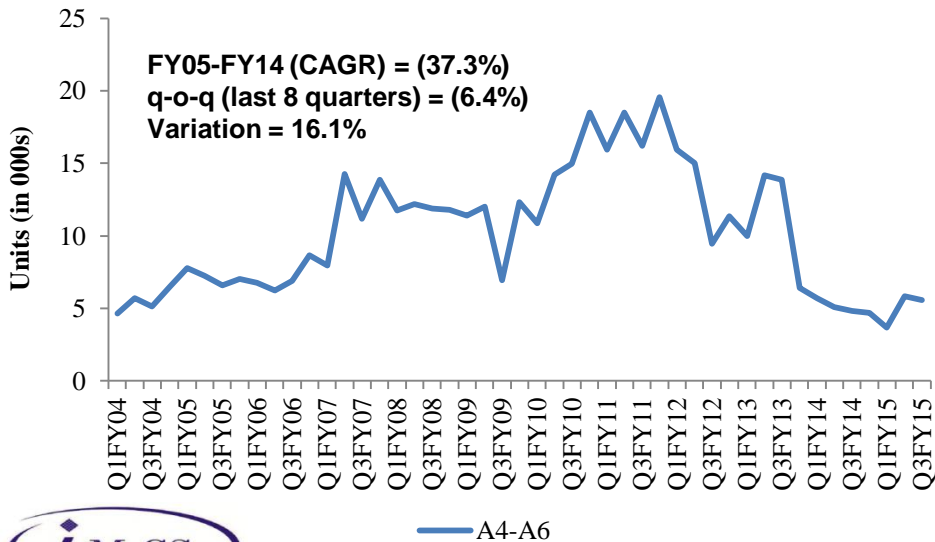
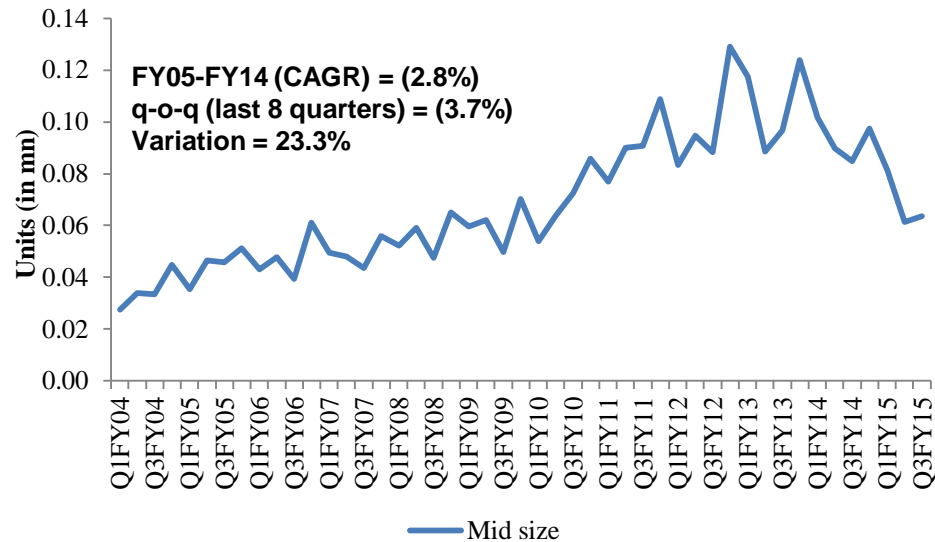
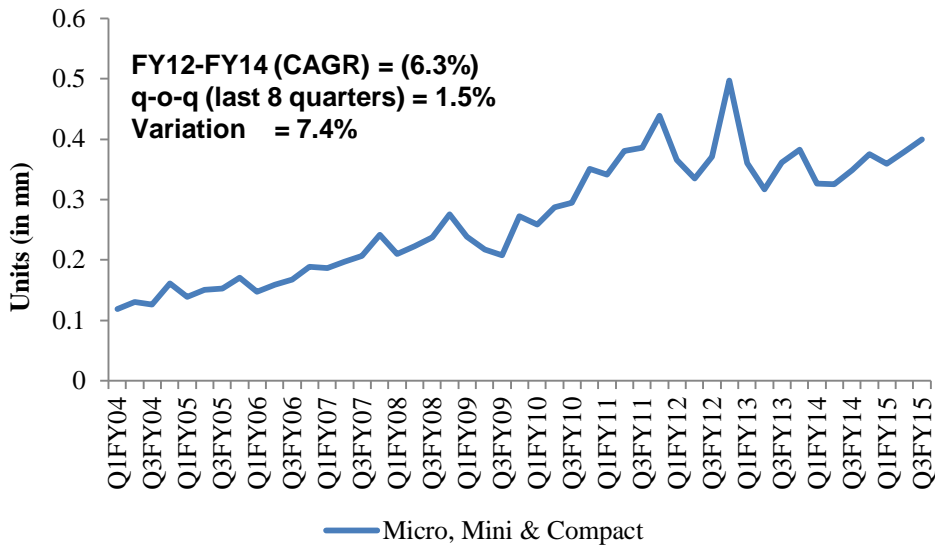
Exogenous adjustment to results from 1+2

Specific models for different vehicle categories

IMaCS Forecasting Model – Coverage					
Category	Models - Category wise Coverage				
Passenger Vehicles	A1	A2	A3	A4,A5, A6	UV
Two Wheelers	Motorcycles	Scooters	Mopeds		
Three Wheelers	3w Goods	3w Passengers			
LCV & MHCV	SCV <3.5	LCV	MHCV 7.5 to12T	MHCV Total	Buses

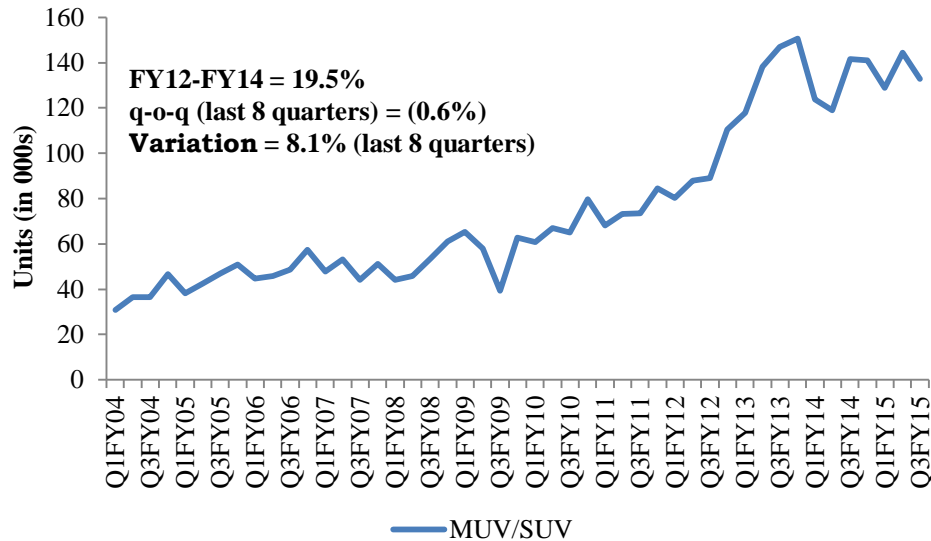
Passenger Vehicles

Passenger car sales showing weakness post FY13



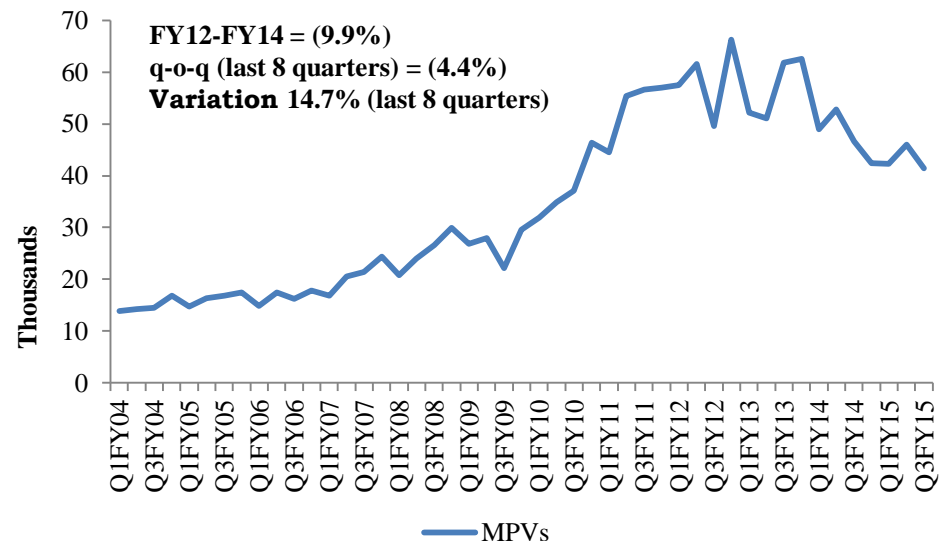
- **Compact:** recovery since July 2014, with softening inflation & reduction in fuel prices
- **Midsized:** Stagnation and declining trend
- **A4-A6:** Fall, but signs of recovery seen

New model launches have driven growth in sales of SUVs



- After showcasing a growth of 21%, 10%, 23% and 51% respectively from FY09 to FY13, the segment declined by 5.1% in FY14 and still continues to remain weak except for the festive season

- After witnessing strong growth of 41%, 42% and 10% respectively from FY09 to FY12 the segment has showed signs of weakness in FY13 and FY14 on account of no new launches in the segment
- Current Fiscal outlook also continues to remain bleak with the 3rd quarter showing a decline in excess of 10%



Demand drivers

Economic

- GDP q-q
- Excise Rates
- Interest rates
- Weighted Fuel prices
- Private Final Consumption Expenditure (PFCE)
- WPI – Auto-parts index

Industrial Variables

- New model launches
- Inventory levels

Other factors

- Substitution from other category of vehicles (A1 and Motorcycles/Scooters)
- Substitution within the category (A2 to A3, A2 to Compact SUV, A3 to SUV etc.)

Zero order correlation matrix – Illustrative – A1&A2 segment

Correlations

		A1	GDP at factor cost (Q)	PFCE	Excise Duty	Interest Rate	Fuel Price	motorcycle sales	scooter sales	Motorcycle + Scooter	A1A2
a1	Pearson Correlation	1	.758**	.760**	-.357*	.125	.761**	.822**	.823**	.835**	.679**
	Sig. (2-tailed)		.000	.000	.020	.482	.000	.000	.000	.000	.000
	N	42	42	42	42	34	42	42	42	42	42
gdpcfq	Pearson Correlation	.758**	1	.983**	-.770**	-.201	.884**	.928**	.900**	.934**	.917**
	Sig. (2-tailed)	.000		.000	.000	.254	.000	.000	.000	.000	.000
	N	42	42	42	42	34	42	42	42	42	42
pfceo	Pearson Correlation	.760**	.983**	1	-.760**	-.187	.901**	.937**	.914**	.944**	.872**
	Sig. (2-tailed)	.000	.000		.000	.290	.000	.000	.000	.000	.000
	N	42	42	42	42	34	42	42	42	42	42
a1a2	Pearson Correlation	.679**	.917**	.872**	-.785**	-.335	.711**	.875**	.774**	.855**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.053	.000	.000	.000	.000	
	N	42	42	42	42	34	42	42	42	42	42

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Functional Form & Related Statistics –A1& A2 Elasticity Model

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.932 ^a	.868	.861	.12848

a. Predictors: (Constant), lnexcise, lnpfce

b. Dependent Variable: ln1a2

Causal model explains upto 87% variability..... NOT good enough !

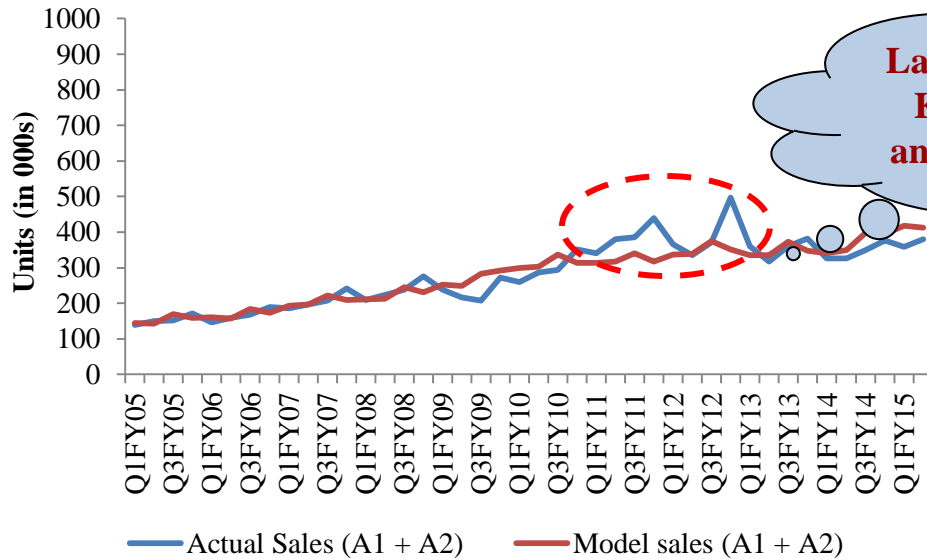
Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.982	2.094		-.469	.642
	lnpfce	1.058	.141	.693	7.497	.000
	lnexcise	-.285	.092	-.285	-3.084	.004

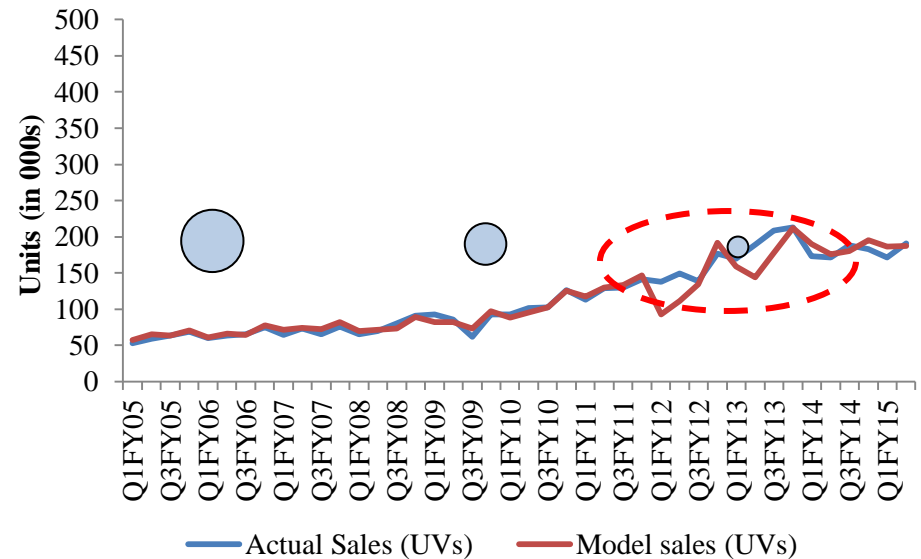
a. Dependent Variable: ln1a2

$$\text{Ln (A1+A2 sales)} = -0.982 + 1.058 \text{ Ln (PFCE)} - 0.285 * \text{Ln (Excise)}$$

Causal model alone does not explain short term demand behaviour completely – E.g. New Model Launches

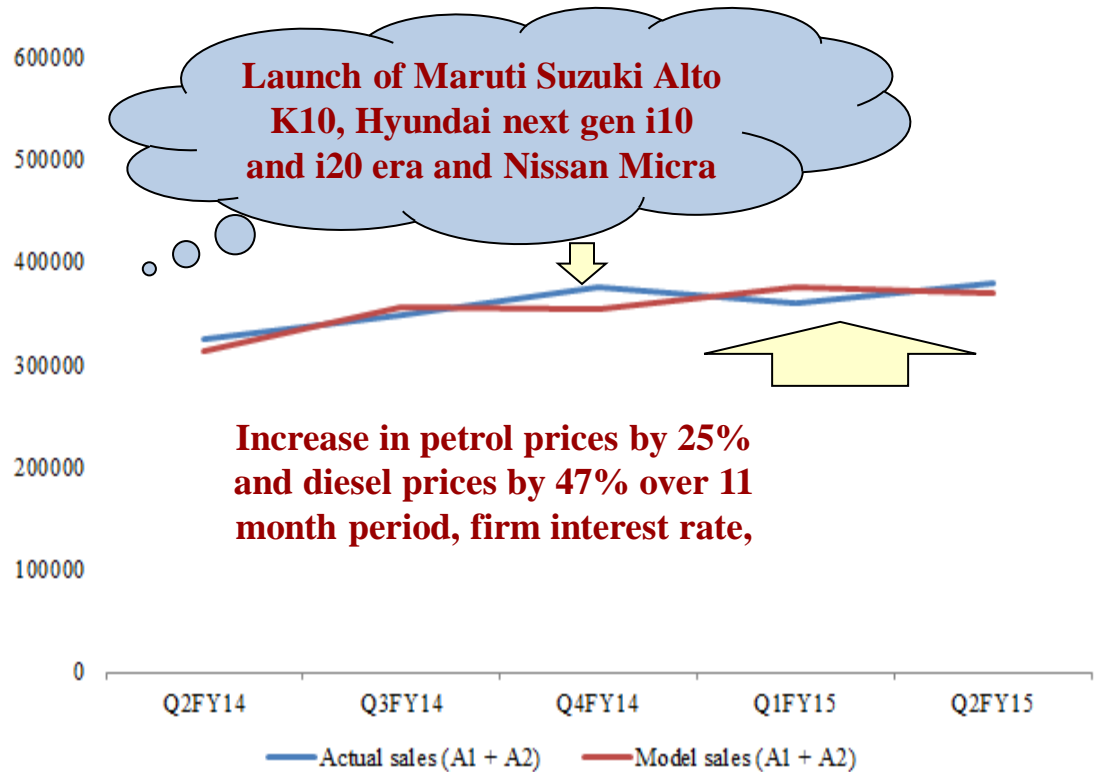


Launch of Mahindra XUV 500, Bolero new generation, Maruti Suzuki Ertiga and Renault Duster



Revised estimates post time series correction –Q1 FY14 to Q2 FY15

	Actual Sales (A1 + A2)	Model sales (A1 + A2)
Q2FY14	325848	313872
Q3FY14	348893	356174
Q4FY14	375558	354283
Q1FY15	359297	374935
Q2FY15	379434	370010

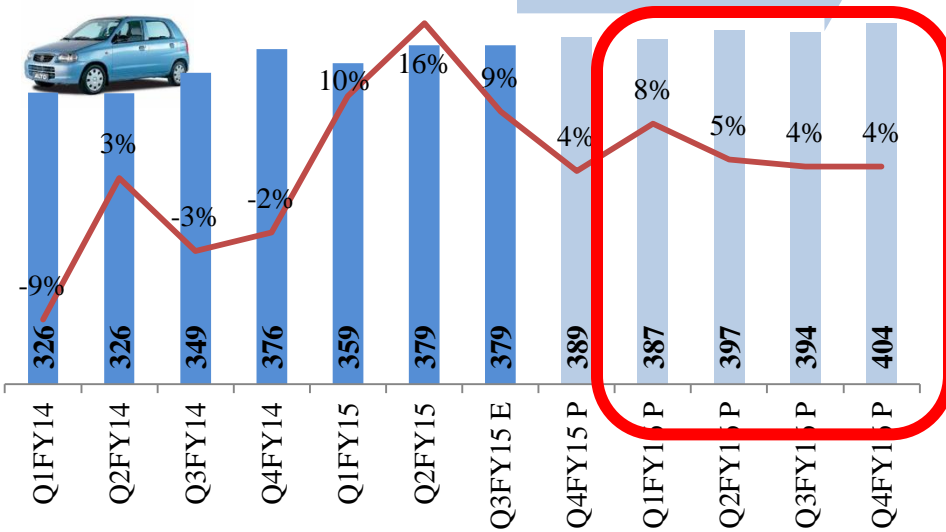


- **Causal and time series adjustment increases model accuracy significantly**
- **The above estimates does NOT take into account module 3 adjustments – This will further improve model accuracy**

Passenger Cars to grow at 4.7% in FY16 with compact segment leading the growth (Results of Causal Model and Time Series Correction)

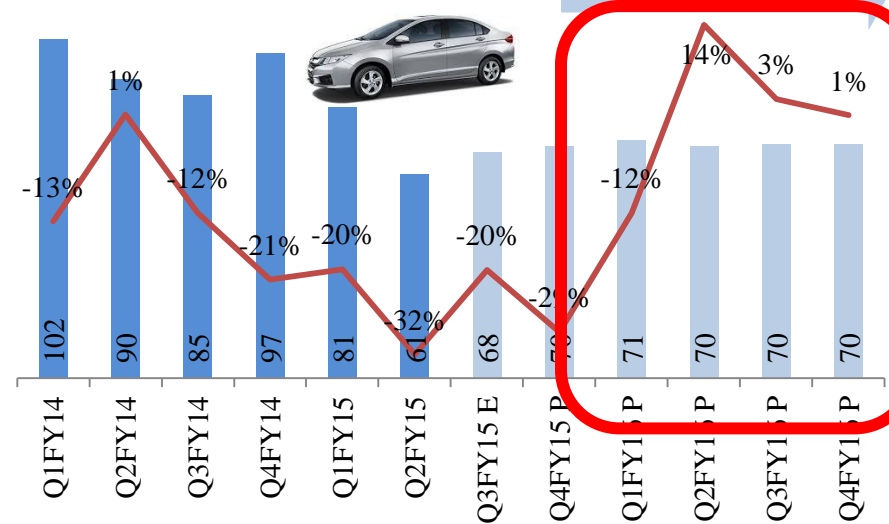
Micro, Mini & Compact

FY16 growth: 5%



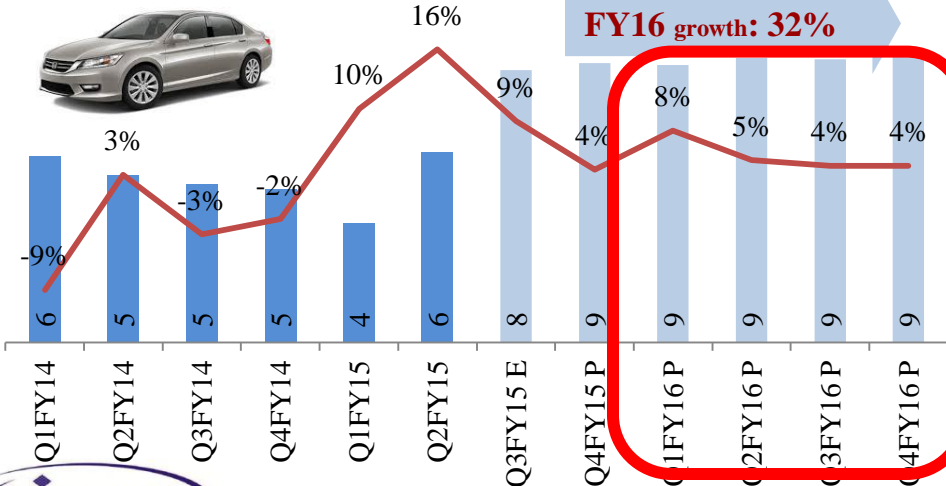
Midsize

FY16 growth: 0.5%



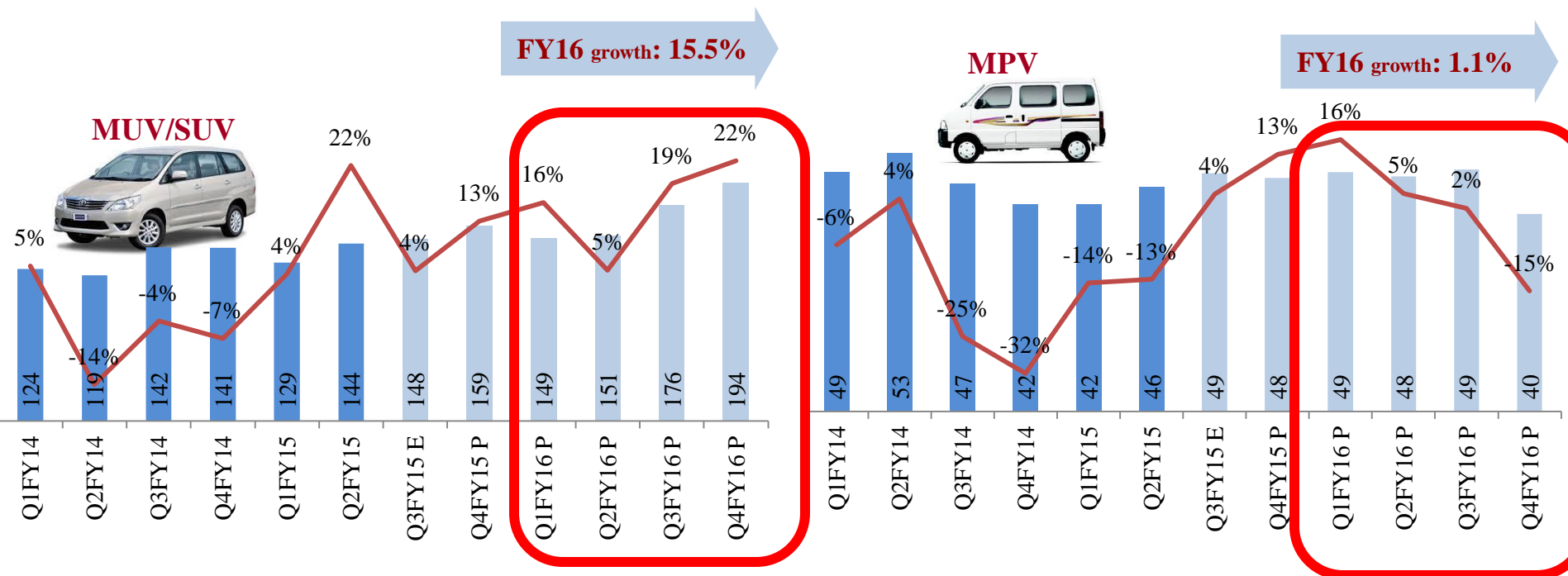
A4 to A6

FY16 growth: 32%



- Recovery in GDP growth, cooling inflation lead to reduction in interest rates and falling crude prices to drive demand
- Compact and premium segment to benefit the most as a slew of model launches are also expected in those segments
- Premium segment expected to get push on account of lower base and planned launches

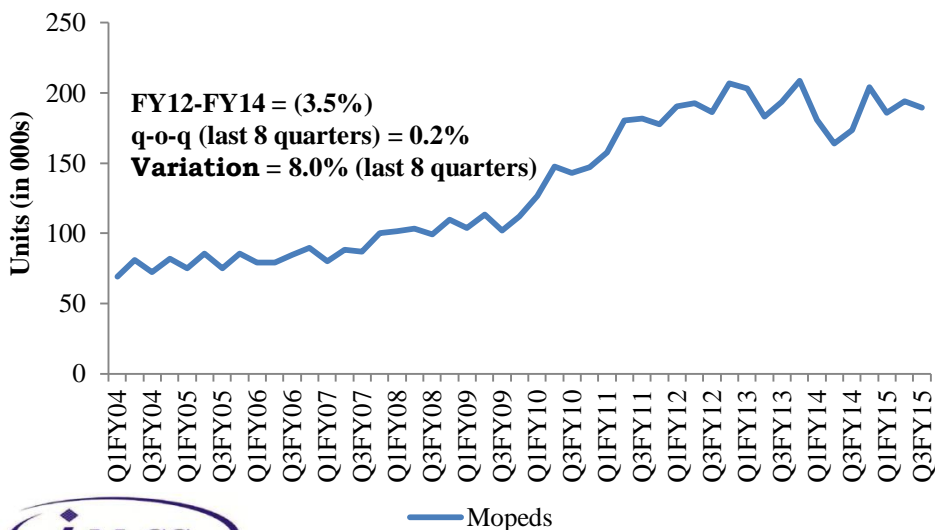
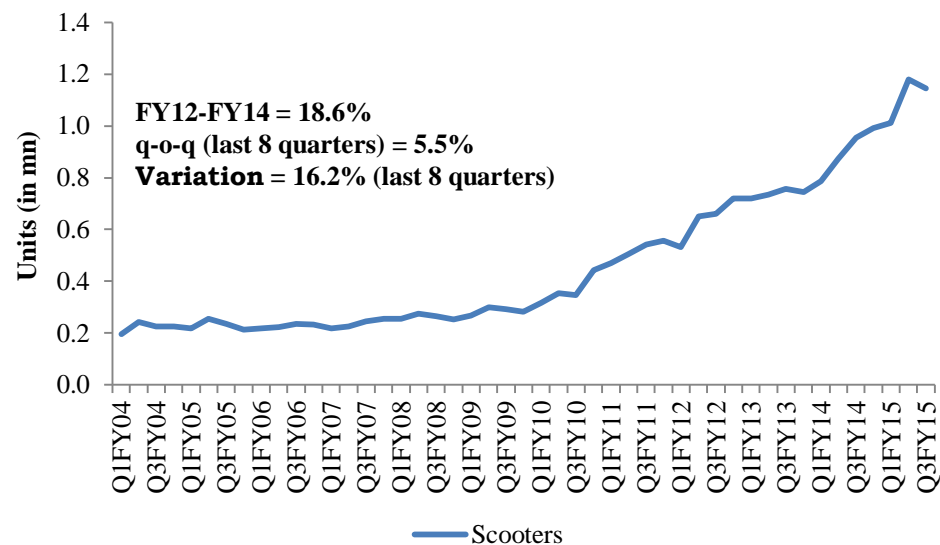
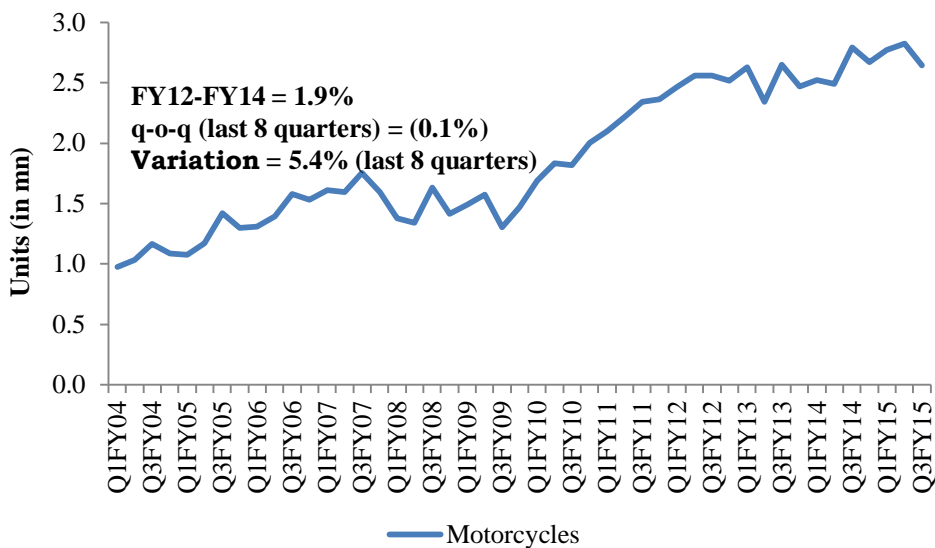
Utility Vehicles to grow at 12% in FY16 with SUV segment leading the growth



- SUV/MUV segment to continue its momentum in FY16 and is expected to witness strong growth in H2FY16
- Also, there are a slew of model launches expected in the segment in the next fiscal
- MPV segment expected to shrink due to capacity constraints and now new model launch in the category

Two Wheelers

Scooters have driven growth in the domestic two wheelers with motorcycles showing sluggishness in the near term



- Scooters have witnessed a high 25% plus growth since FY09 outpacing the growth in motorcycles which also grew at a healthy 12.4% (on a much higher base)
- Model launches have helped the segment grow at a faster pace
- Motorcycles have shown significant weakness since FY12

Demand drivers

Economic

- Q-Q GDP
- Excise Rate
- Interest
- Weighted Fuel Price
- Private Final Consumption Expenditure (PFCE)
- Population in the age bracket of 15-29 years
- WPI – Auto-parts index

Industrial Variables

- New model launches for scooters as well as motorcycles
- Inventories

Other factors

- Substitution from other category of vehicles (A1 and Motorcycles/Scooters etc.)
- Substitution within the category (scooters to motorcycles, Motorcycles to Scooters etc.)

Zero order correlation matrix – Illustrative – Motorcycles segment

Correlations

		Motorcycles	Scooters	Fuel Price	Excise duty	Interest rates	GDP at factor cost (Q)	PFCE	Population of age 15-29 years
Interest rates	Pearson Correlation	-.241	-.101	.059	.222	1	-.176	-.151	-.211
	Sig. (2-tailed)	.176	.576	.744	.214		.326	.401	.237
PFCE	N	33	33	33	33	33	33	33	33
	Pearson Correlation	.912*	.946**	.889*	-.368	-.151	.971**	.331	.803*
	Sig. (2-tailed)	.000	.000	.000	.035	.401	.000		.000
	N	33	33	33	33	33	33	33	33
Motorcycles	Pearson Correlation	1	.932**	.906**	-.240	-.241	.901**	.912**	.700**
	Sig. (2-tailed)		.000	.000	.179	.176	.000	.000	.000
	N	33	33	33	33	33	33	33	33

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Functional Form & Related Statistics – Motorcycles Elasticity Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.917 ^a	.841	.824	.10485

a. Predictors: (Constant), lnage, lnint, lnpcfce

Causal model explains upto 91% variability.....

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.590	6.805		2.144	.041
	lnpcfce	.742	.234	.514	3.173	.004
	lnint	-.527	.202	-.207	2.614	.014
	lnage	6.914	2.866	.384	2.412	.022

a. Dependent Variable: lnmc

Ln (motorcycle sales) = - 14.590+0.742*Ln PFCE- 0.527*Ln interest rate +6.914*LnAge

Estimates subject to time series correction !

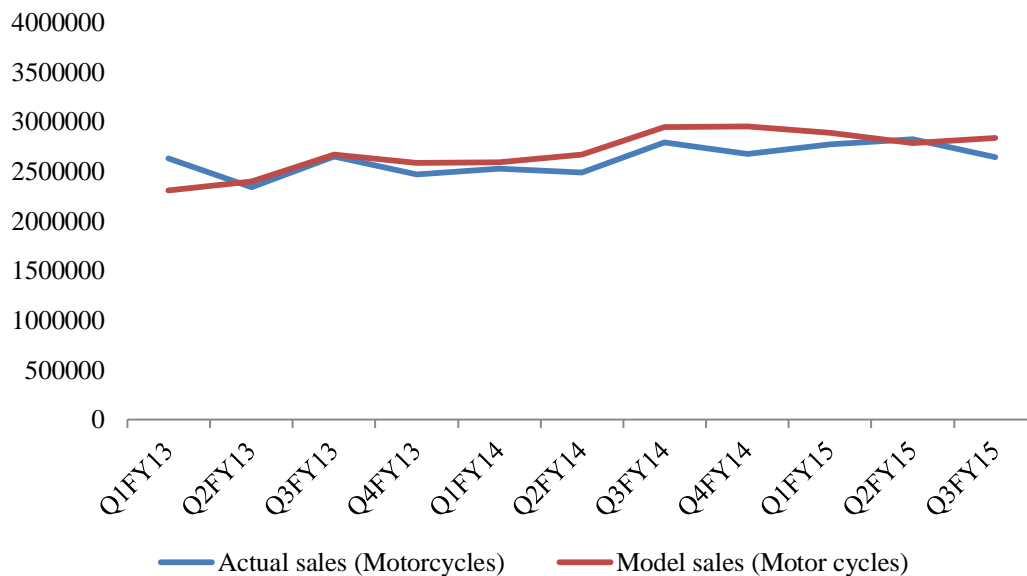
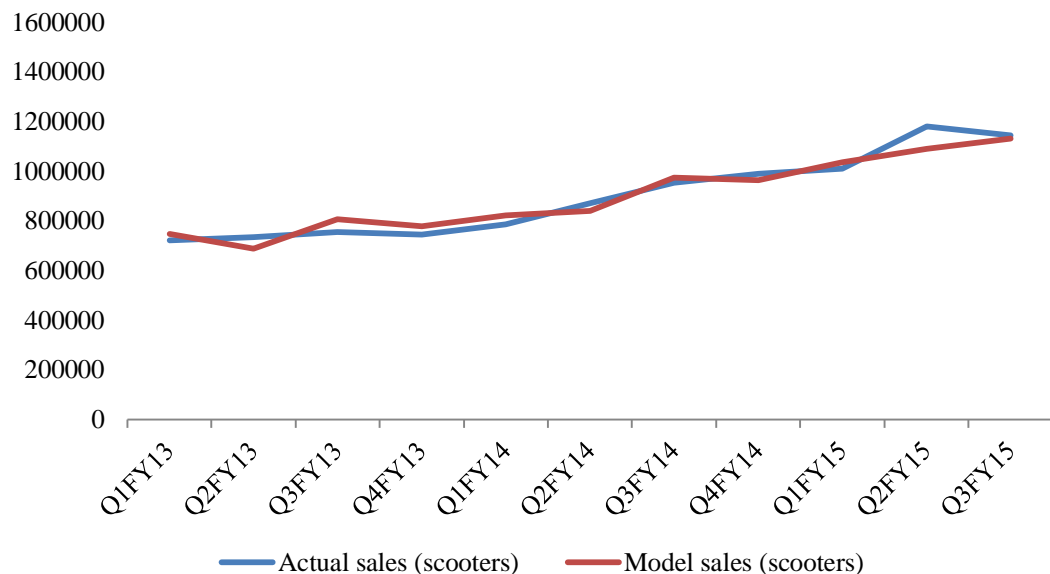
Backtest chart post time series correction –Q1 FY13 to Q3 FY15

	Actual sales (scooters)	Model sales (scooters)
Q1FY13	720884	748462
Q2FY13	734714	689707
Q3FY13	756162	806876
Q4FY13	745192	777716
Q1FY14	785591	823482
Q2FY14	872330	840310
Q3FY14	953471	975315
Q4FY14	991352	965126
Q1FY15	1010422	1035611
Q2FY15	1179929	1091614
Q3FY15	1144591	1131898

	Actual sales (Motorcycles)	Model sales (Motor cycles)
Q1FY13	2628949	2310365
Q2FY13	2341641	2395055
Q3FY13	2647753	2665567
Q4FY13	2466590	2584419
Q1FY14	2524316	2591805
Q2FY14	2489807	2669502
Q3FY14	2793399	2943172
Q4FY14	2672295	2949180
Q1FY15	2772573	2886606
Q2FY15	2826111	2785175
Q3FY15	2641923	2834352

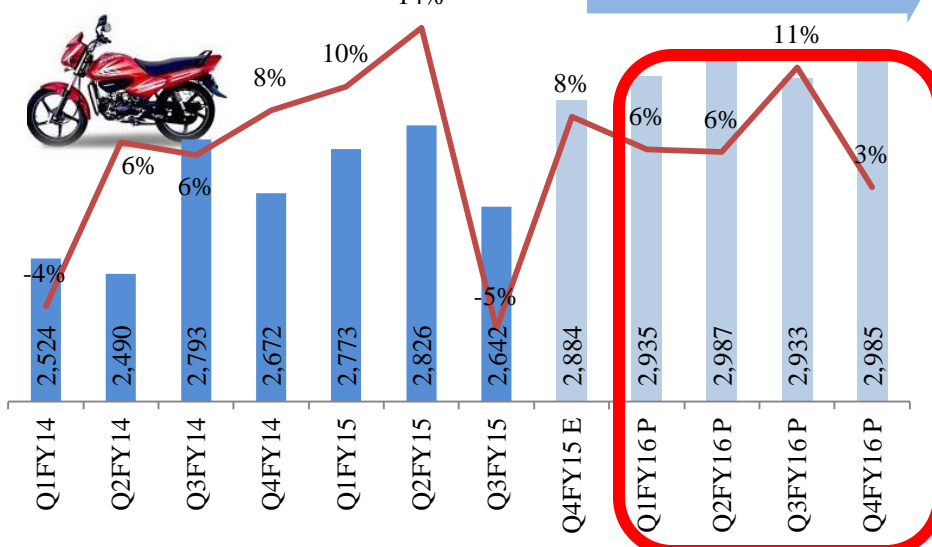
- Model is accurate upto 95%
- **The present estimates does NOT take into account module 3 adjustments – Expected to further improve forecast accuracy**

Revised error rate chart post time series correction –Q1 FY13 to Q3 FY15

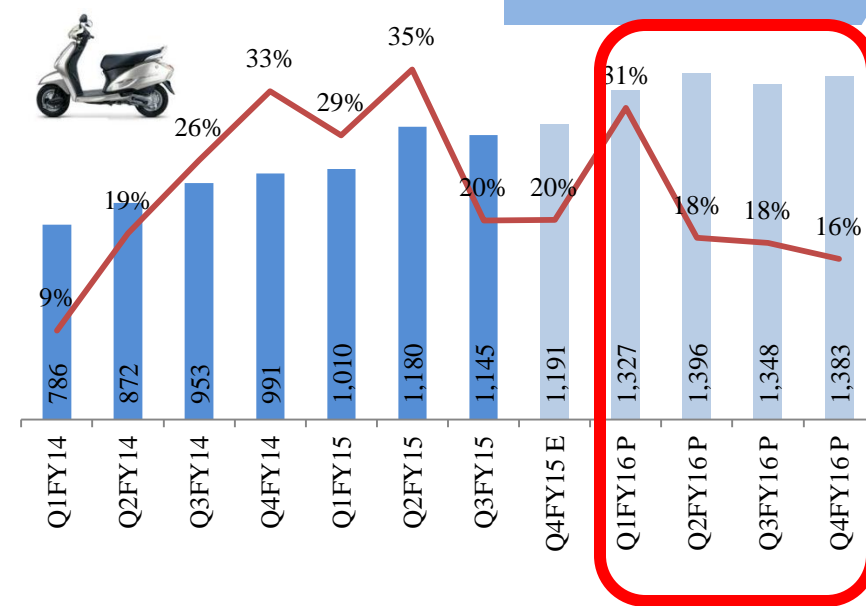


Two wheelers to grow at 10.5% in FY16 with scooter segment leading the growth

Motorcycles



Scoters



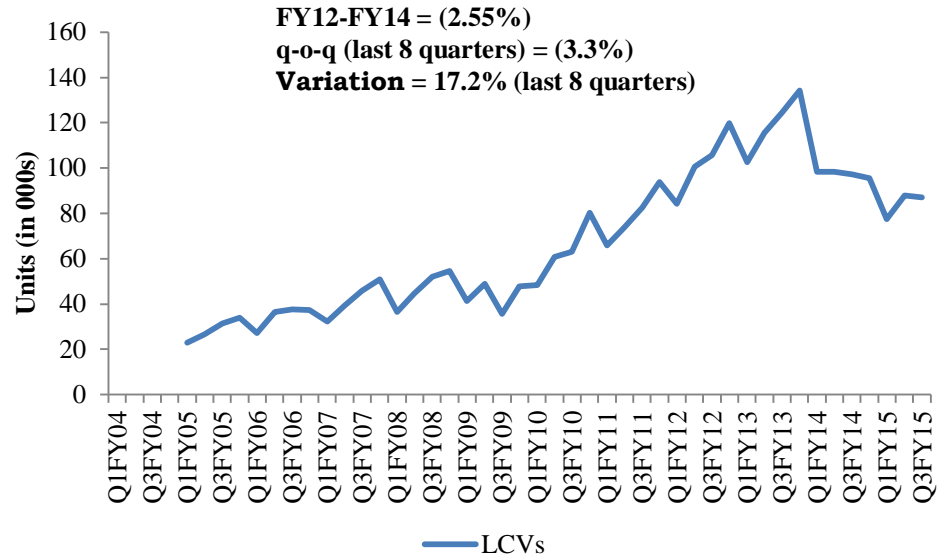
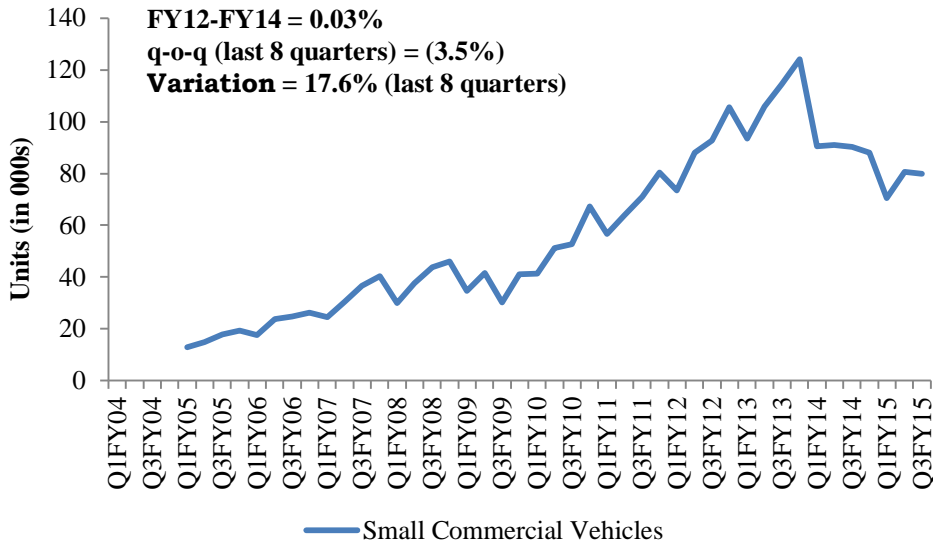
Mopeds



- Scooters to continue their growth momentum
- Capacity additions to benefit scooter manufacturers
- Motorcycles and Mopeds showing some signs of recovery; while motorcycles are expected to show marginal growth, mopeds are expected to fare better

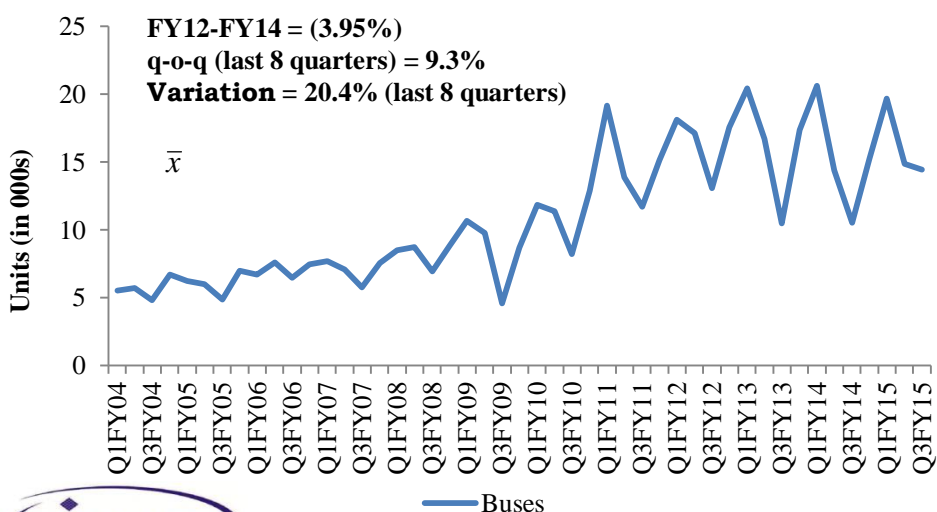
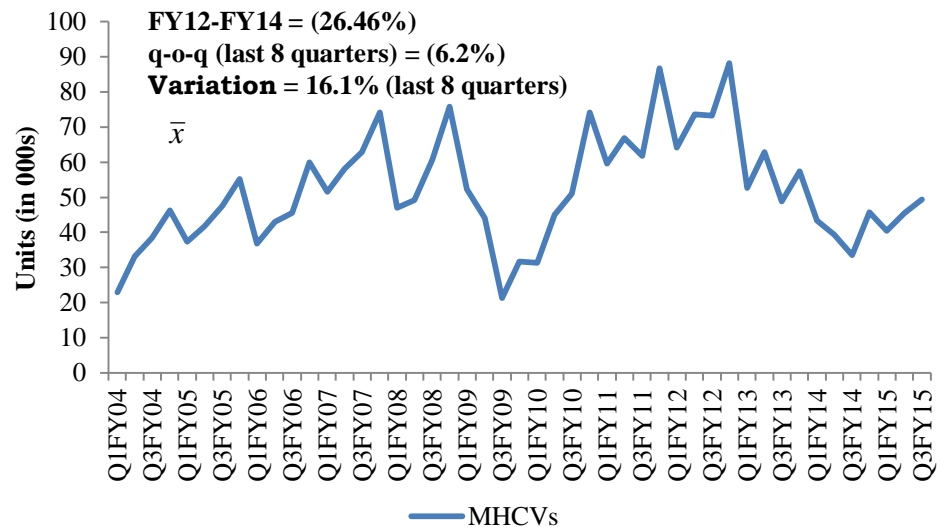
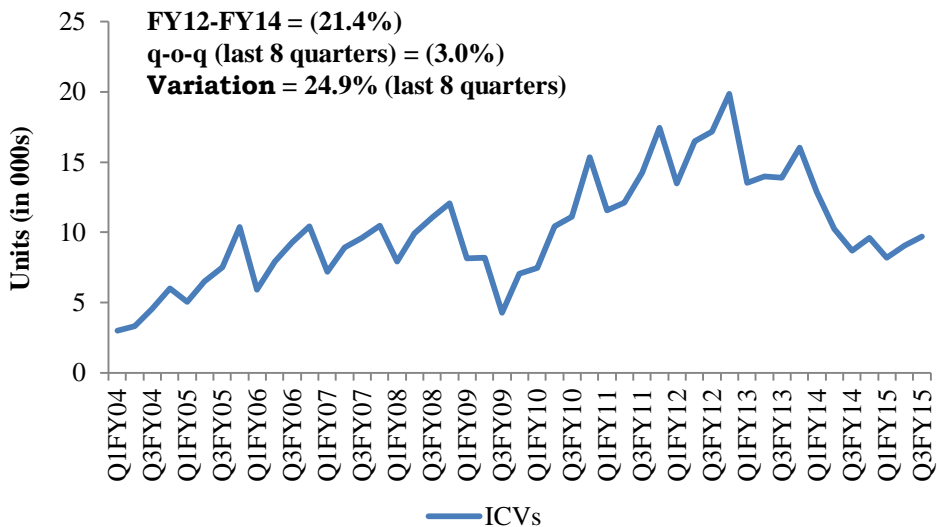
Commercial Vehicles

Small Commercial Vehicles have driven growth in the LCV segment



- Since the creation of the Small Commercial Vehicles segment (launch of Tata Ace) in May 2005, the segment has shown robust growth. For the first time since May 2005 the segment has showed signs of deceleration in FY14
- Pick-up segment is showing slow and gradual recovery
- Other segments of LCV continue to remain stagnant owing to no newer options available

Recovery signs visible in M&HCV post formation of new government



- After a y-o-y decline for 27 straight months since March 2012, the domestic MHCV industry recorded a positive growth of 3% y-o-y in June 2014 and has stayed in green since then
- Sales of Heavy Commercial Vehicle (HCV) goods (GVW >12tonnes) have outpaced that of Intermediate Commercial Vehicle (ICV) (GVW 7.5-12tonnes)



Demand drivers

Economic

- GDP Manufacturing
- Index of Industrial Production (IIP)
- Excise
- Interest rates
- Fuel prices
- Private Final Consumption Expenditure (PFCE)
- WPI – Auto-parts index

Industrial

- New model launches in LCV category
- Inventory Levels
- Rail freight quarterly numbers

Other factors

- Road freight
- Substitution from Competing modes
- Substitution of LCVs by 3 wheelers or ICV/MCV by MAV

Zero order correlation matrix – Illustrative – Small Commercial Vehicles segment

		Correlations							
		SCV (< 3.5 T GWV)	LCV (5 to 7T)	Diesel prices	GDP Mfg (Q)	IIP	Freight Movement by rail	Interest rates	PFCE
GDP Mfg (Q)	Pearson Correlation	.940**	-.845**	.832**	1	.988**	.974**	.082	.953**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.612	.000
	N	41	41	41	41	41	41	41	41
SCV (< 3.5T GWV)	Pearson Correlation	1	-.791**	.801**	.940**	.900**	.905**	.058	.663**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.715	.000
	N	42	42	42	41	42	42	42	42

Functional Form & Related Statistics – Small Commercial Vehicles Elasticity Model

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.977 ^a	.954	.953	.13431

a. Predictors: (Constant), lngdpM

Causal model explains upto 96% variability....

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-8.787	.687		-12.797	.000
	lngdpM	2.630	.092	.977	28.491	.000

a. Dependent Variable: ln3.5

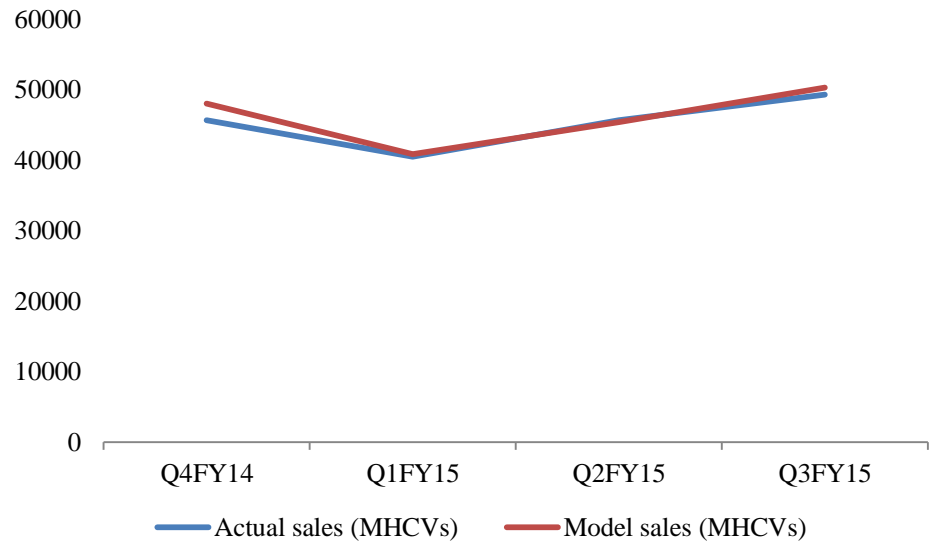
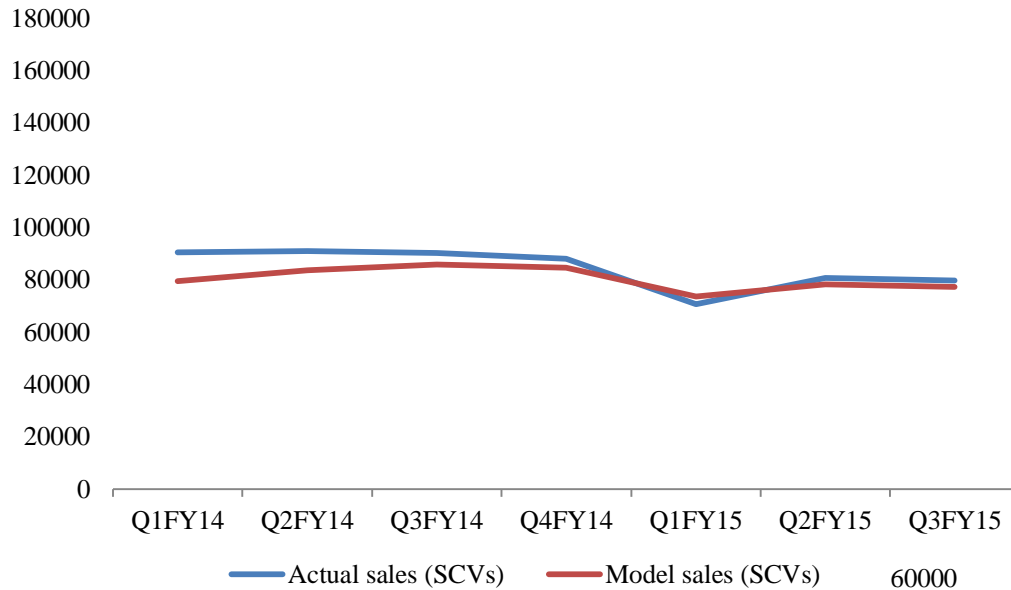
$\ln(\text{SCV sales}) = -8.787 + 2.630 * \ln \text{gdpM}$

Forecast improves after including time series correction – Q1 FY14 to Q3 FY15

	Actual sales (SCVs)	Model sales (SCVs)
Q1FY14	90534	79554
Q2FY14	90977	83539
Q3FY14	90383	85760
Q4FY14	88063	84592
Q1FY15	70567	73655
Q2FY15	80672	78202
Q3FY15	79828	77292

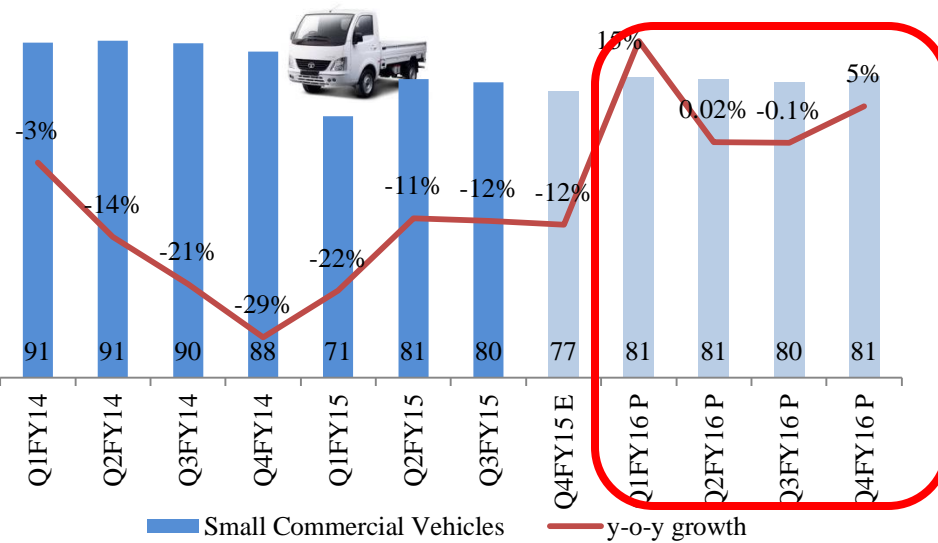
- Causal and time series adjustment get the forecast to about 96% accuracy
- **The present estimates does NOT take into account module 3 adjustments – Expected to further increase forecast accuracy**

Revised error rate chart post time series correction –Q1 FY14 to Q3 FY15

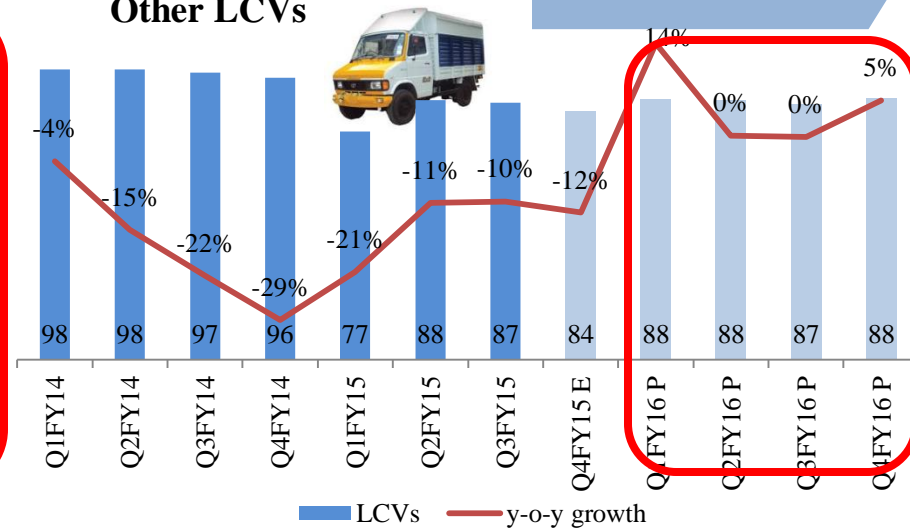


SCVs to showcase marginal growth in FY16

Small Commercial Vehicles

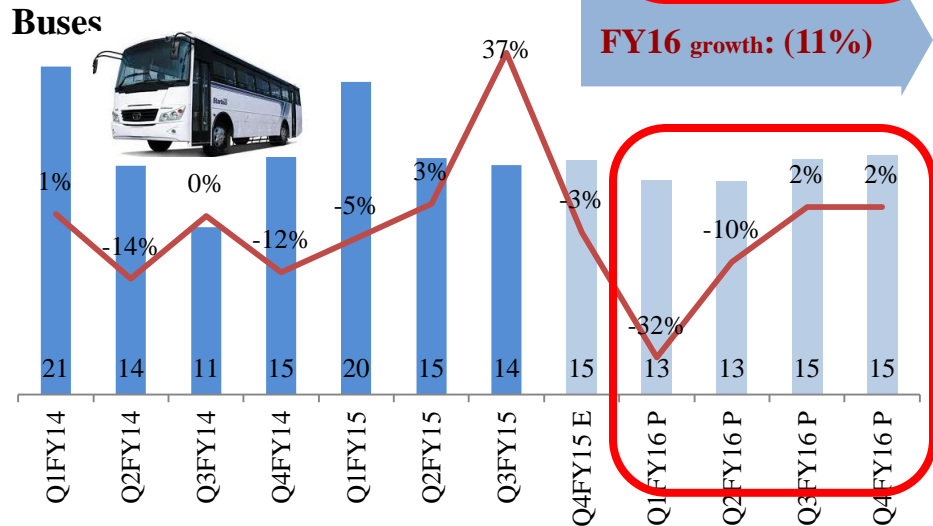
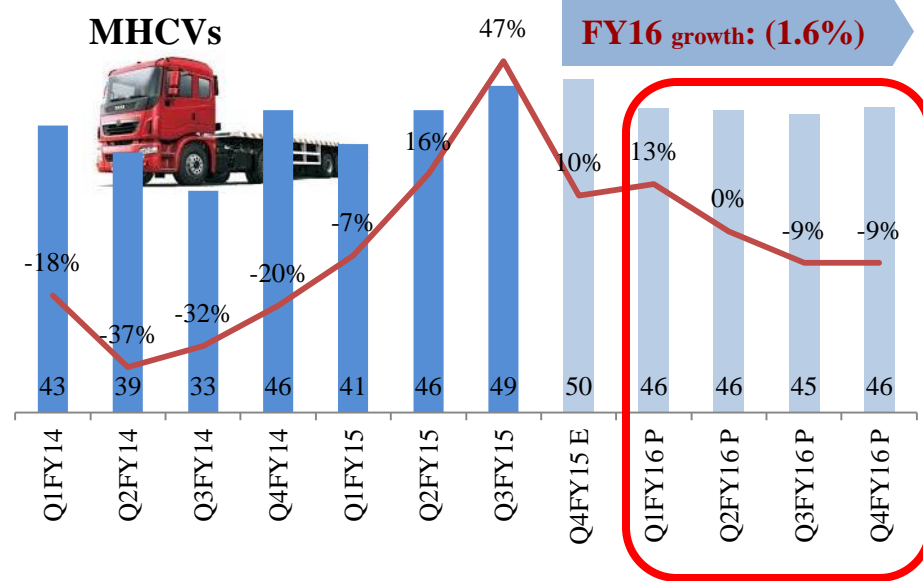


Other LCVs



- Small Commercial Vehicles expected to perform better on account on improvement in demand of consumables reflected by improving PFCE
- Other segments of LCVs to continue its sluggishness

MAVs to lead recovery; however buses to face sluggishness on account of withdrawal of JNNURM

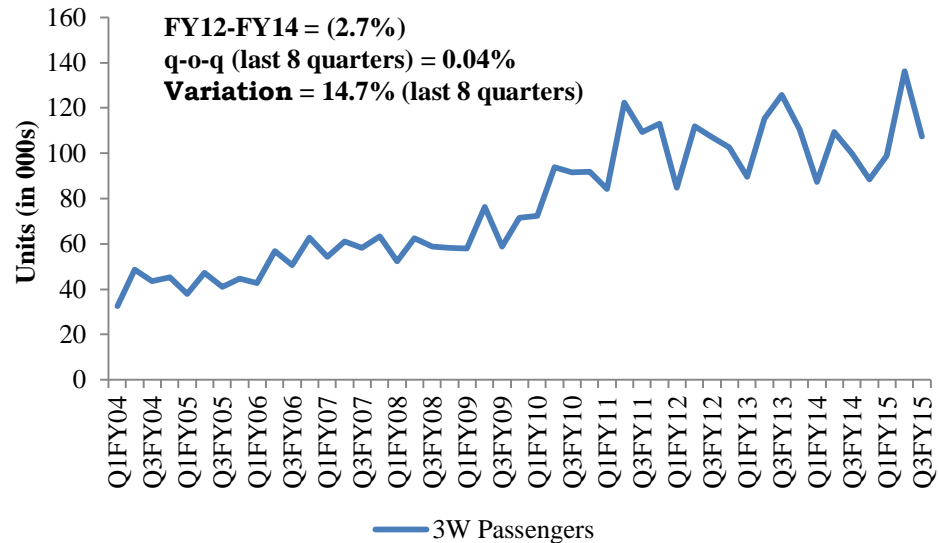
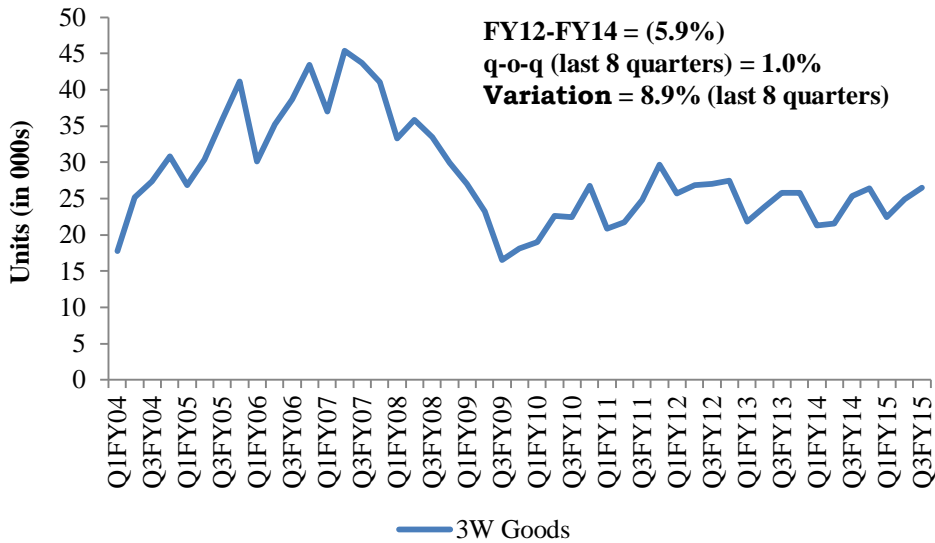


- Withdrawal of JnNURM scheme to impact the bus segment significantly
- MHCVs expected to show strong recovery lead by growth in MAVs
- ICVs would continue their downtrend owing to loss of business to MCVs on account of better cost economics

All quarterly sales figures are in '000s
Source: SIAM, IMAcS analysis

Three wheelers

Growth driven by 3 wheeler passengers



- Since the launch of Tata Ace in May 2005, 3 wheeler goods have showed continuous deceleration in growth and from Q3FY10 they have been range bound
- Growth in 3 wheelers is on account of growth in the passenger segment. Current fiscal has seen strong growth on account of additional rickshaw permits being issued by several state governments
- 3 Wheeler passenger continues to remain a highly regulatory driven segment

Demand drivers

Economic

- GDP (Q)
- Index of Industrial Production (IIP)
- Excise Rate
- Interest rates
- Fuel prices
- Growth in Private Final Consumption Expenditure (PFCE)
- WPI – Auto-parts index

Industrial

- Inventory
- New launches

Other factors

- Substitution from Small Commercial Vehicles

Zero order correlation matrix – Illustrative – 3 wheeler passenger segment

Correlations

		3 wheeler Goods	3 wheeler Passengers	Fuel Price	IIP	PFCE	Interest rates	GDP at factor cost
PFCE	Pearson Correlation	-.584	.948	.883	.912	1	-.008	.979
	Sig. (2-tailed)	.000	.000	.000	.000		.960	.000
	N	37	37	37	37	37	37	37
GDP at factor cost (Q)	Pearson Correlation	-.559**	.942**	.880**	.923**	.979**	-.093	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.556	
	N	37	37	39	39	37	42	42
3 wheeler passengers	Pearson Correlation	-.495**	1	.851**	.866**	.948**	.041	.942**
	Sig. (2-tailed)	.002		.000	.000	.000	.809	.000
	N	37	37	37	37	37	37	37

** . Correlation is significant at the 0.01 level (2-tailed).

Functional Form & Related Statistics – 3 wheeler passenger segment Elasticity Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.942 ^a	.888	.882	.11957

a. Predictors: (Constant), LNGDP, LNPFCE

Causal model explains upto 89% variability..... NOT good enough !

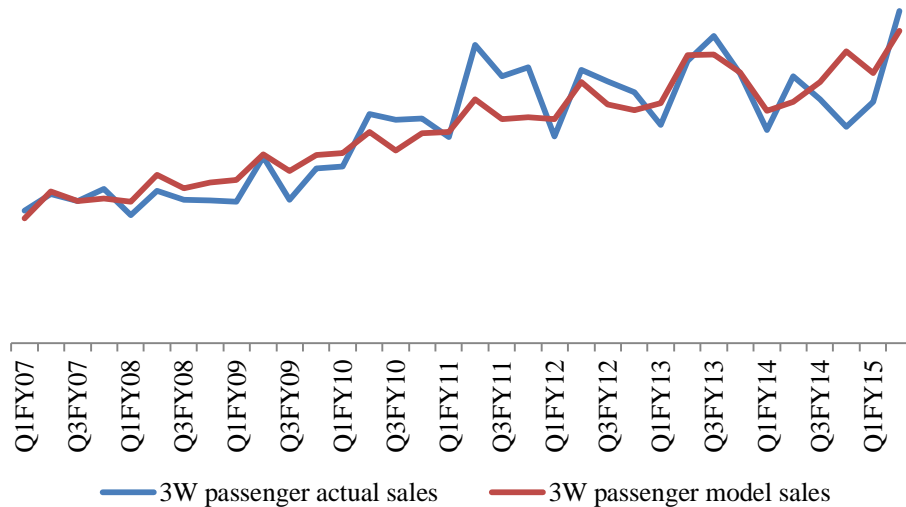
Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-10.970	1.288		-8.515	.000
	LNPFCE	1.521	.288	.869	5.276	.000
	LNGDP	.118	.249	.078	.473	.639

a. Dependent Variable: LN3WP

$\text{Ln (3WP sales)} = -10.970 + 1.521 * \text{Ln PFCE} + 0.118 * \text{Ln GDP}$

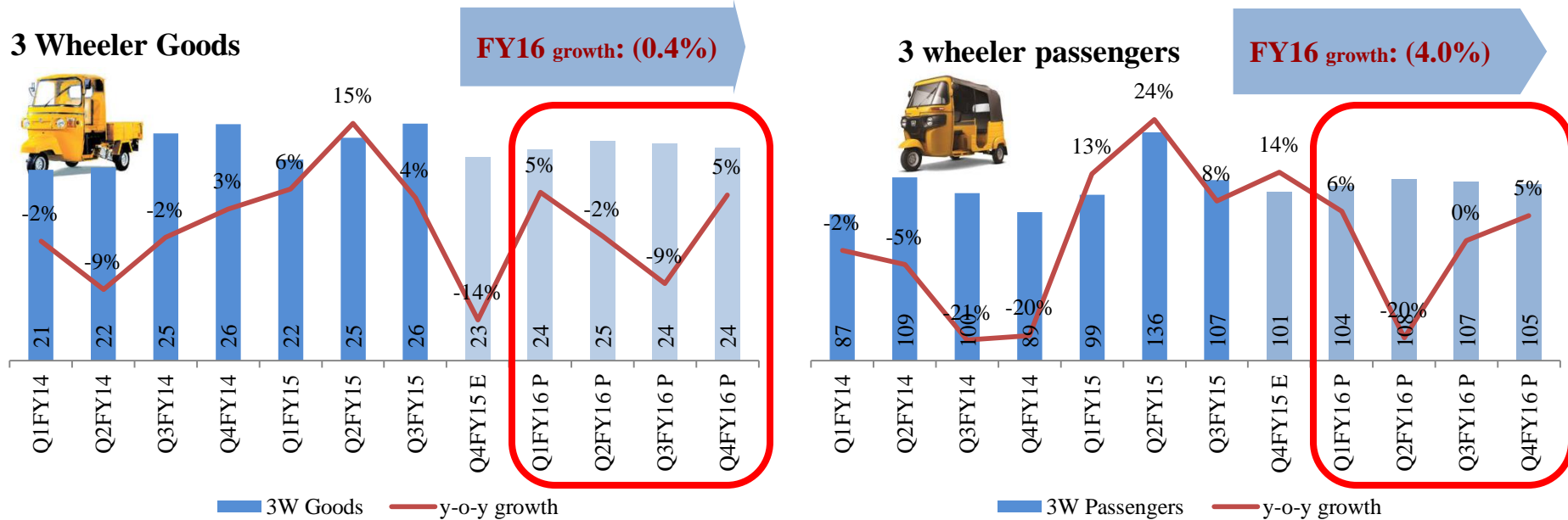
Revised forecast chart post time series correction –Q1 FY14 to Q3 FY15



	3W passenger actual sales	3W passenger model sales
Q1FY13	89467	98333
Q2FY13	115433	117920
Q3FY13	125817	118169
Q4FY13	110401	110809
Q1FY14	87304	95113
Q2FY14	109353	98910
Q3FY14	99735	106979
Q4FY14	88531	119369
Q1FY15	98844	110521
Q2FY15	136059	127968
Q3FY15	107444	96832

- Causal and time series adjustment has reduced the error rates significantly
- **The present estimates does NOT take into account module 3 adjustments – Expected to reduce error rates significantly**

3 wheeler goods would continue to remain sluggish while passenger 3W sales would decline owing to higher base (unless exogenous impetus – e.g. new licenses issued)



- 3 wheeler passenger to record marginal deceleration in growth on account of higher base of FY15
- Majority of 3 wheeler goods demand would again come only from the replacement segment as it would continue to face stiff competition from Small Commercial Vehicles
- Another round of release of permits could lead to a reversal in deceleration of 3 wheeler passengers growth

Discussions