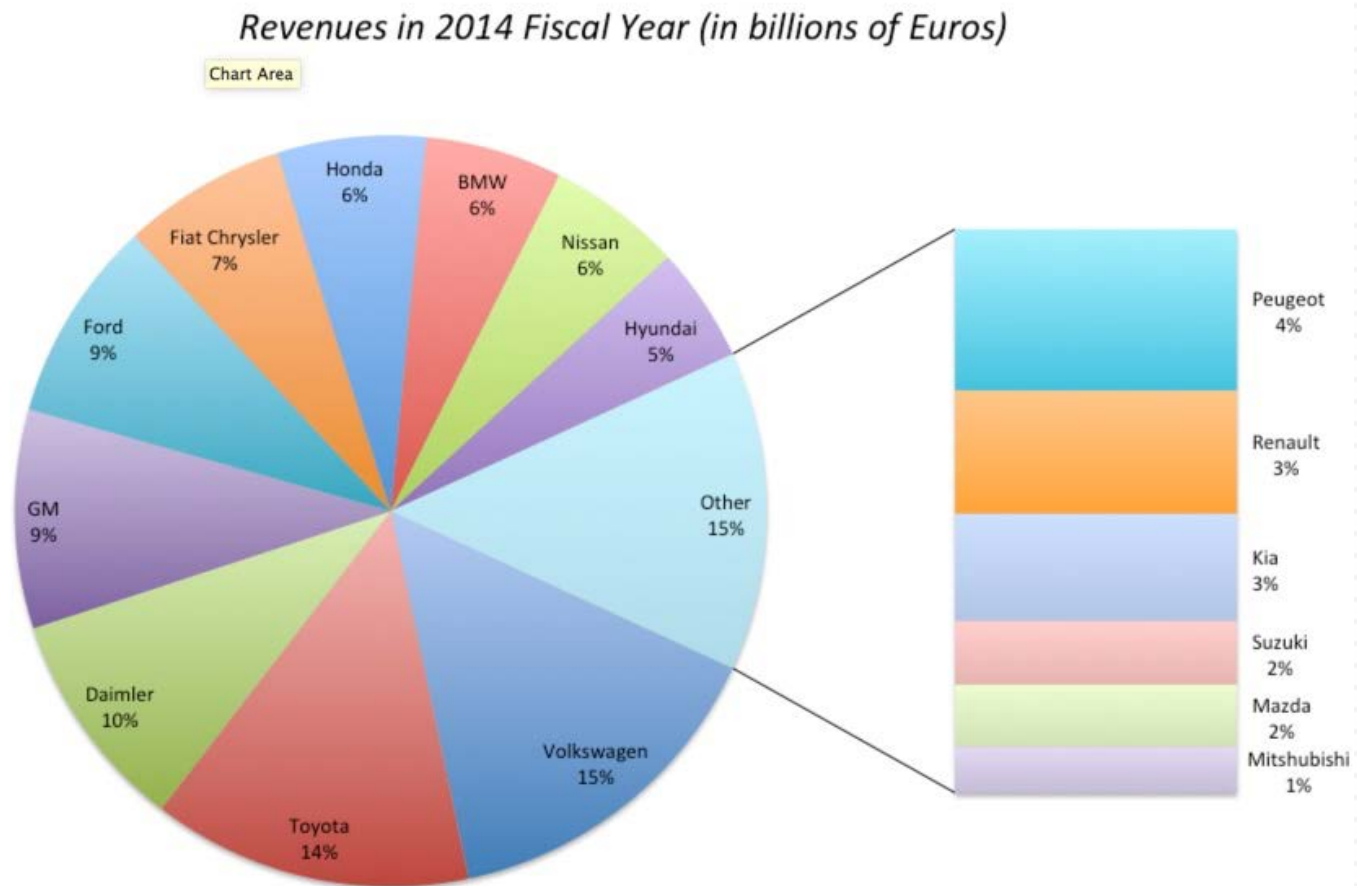




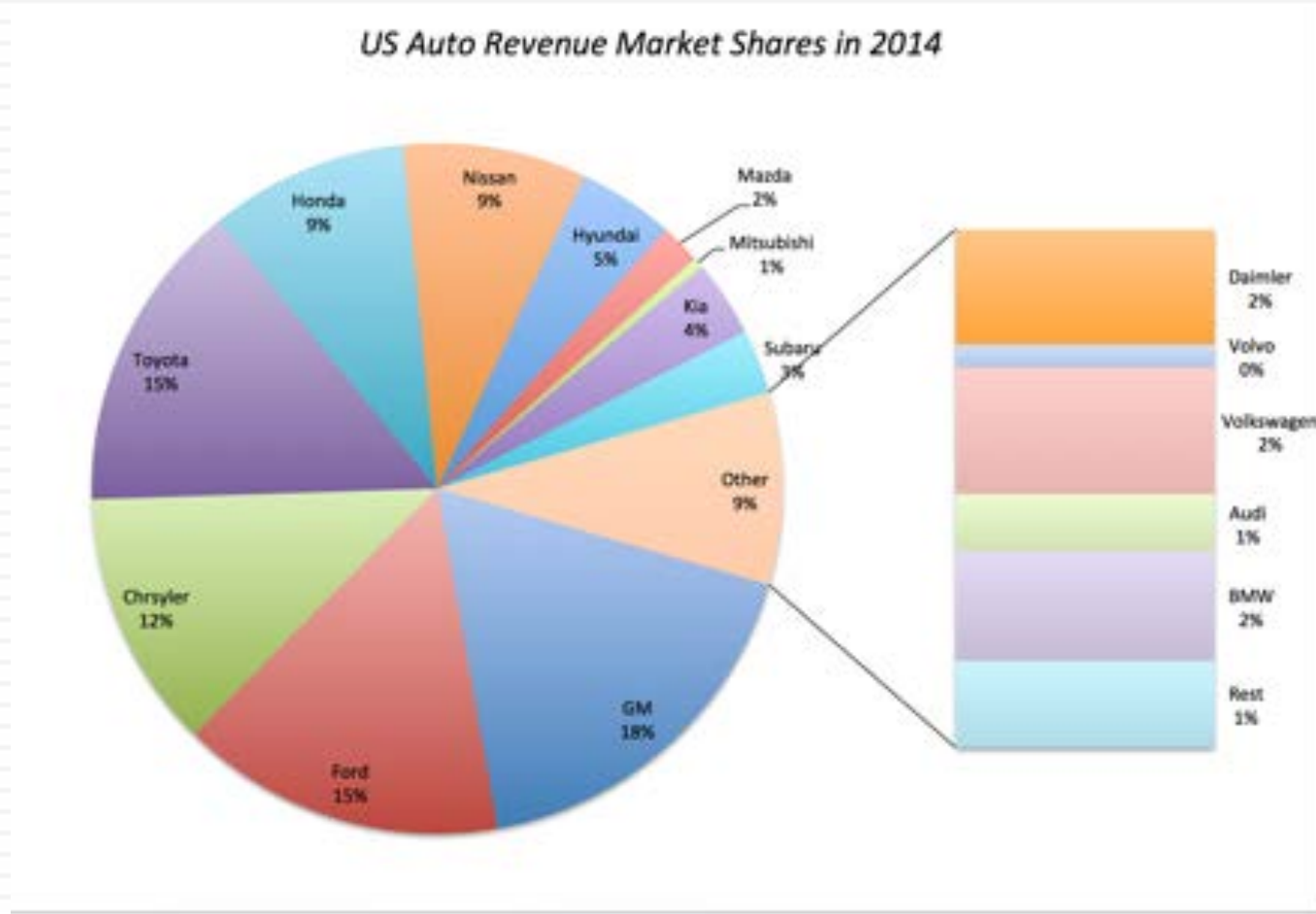
# SCANDAL PRICING: STURM UND DRANG AT VOLKSWAGEN

Sturm und Drang: The Cost of a Scandal

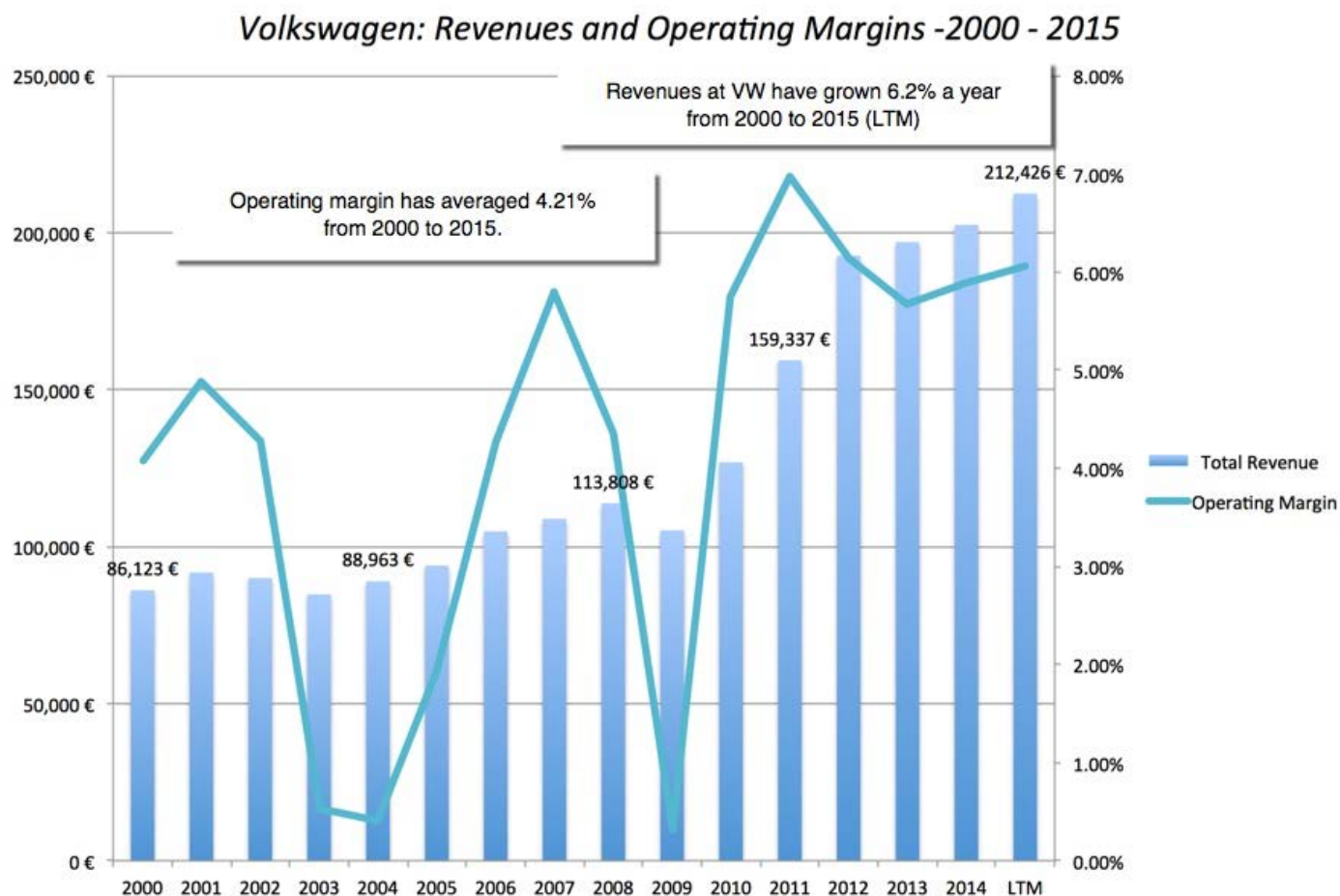
# VW is big, really big, globally..



# Not as much in the US



# And has the operating metrics to back it up..



# The Emissions Scandal

- On its diesel cars, Volkswagen had programmed its computers to detect when the EPA was testing for emissions controls, and switch the car to safe mode, where it emitted far less pollutants than in normal driving model.
- While pressure from the EPA finally led to this admission, narrowly focused on the US, it is unclear whether Volkswagen has been doing the same in Europe.
- About 11 million cars can potentially be affected by this deception and it opens up Volkswagen to not just bad PR, but to legal consequences.

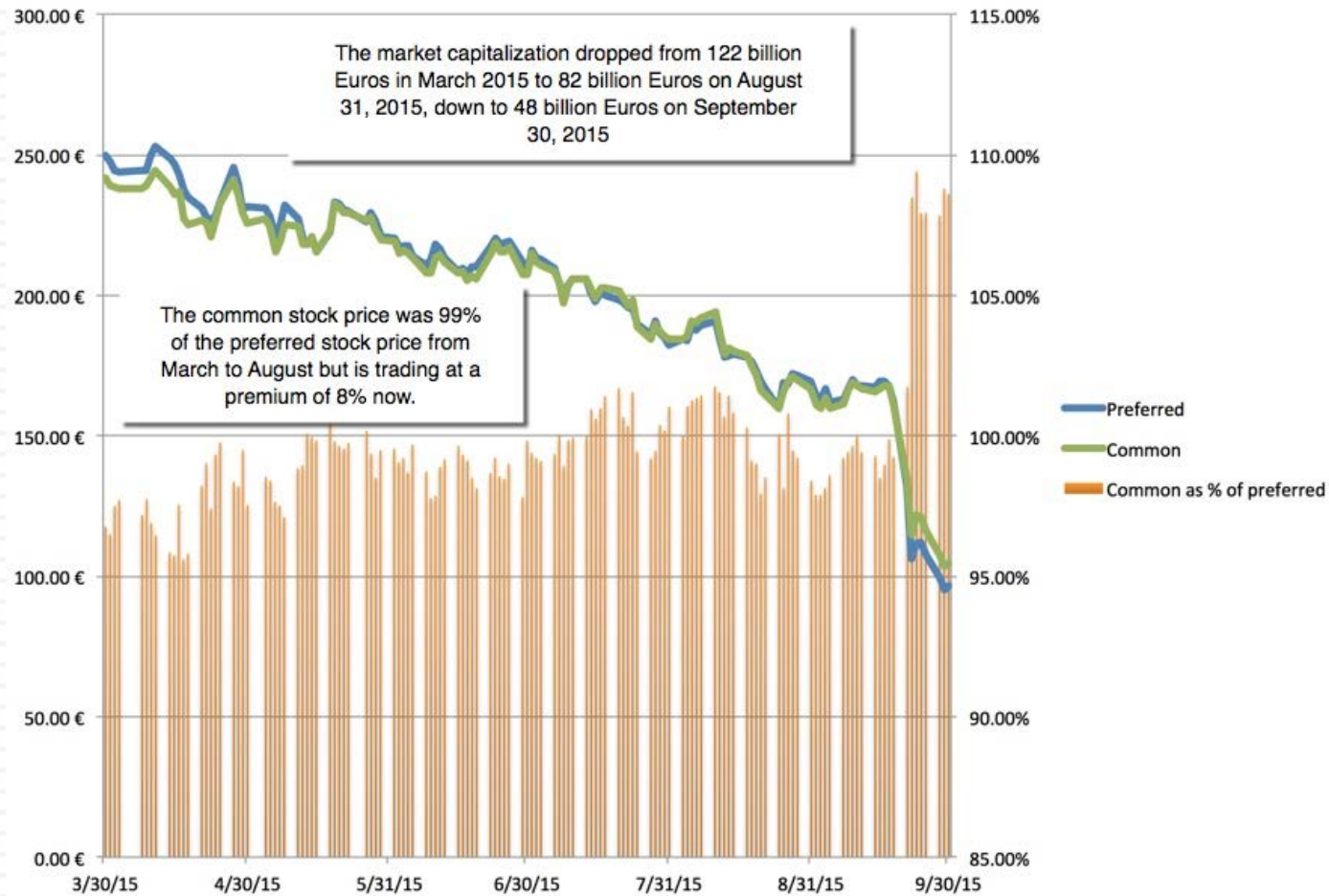
# The potential costs

1. Fines/Penalties: The EPA can fine VW for its cheating, with the estimated fines ranging up to \$18 billion (16.5 billion Euros). VW has already set aside \$7.3 billion to cover these costs.
2. Auto Recall/Lawsuits: VW might have to recall 11 million cars and fix the emissions problem. It is also now open to lawsuits from customers who bought the cars, shareholders and dealers in both the US and Europe.
3. Reputation/Brand Impact: The bad publicity may cause VW to lose sales, as customers decide to switch to competing auto companies.

# The Toyota Experience

	<i>Toyota</i>	<i>Volkswagen</i>
<i>The Scandal</i>	Gas pedals stuck, causing acceleration & accidents.	Computer software fooled EPA on emissions tests, reporting emissions at lower than actual level.
<i>Deaths/Fatalities</i>	37* (NHSTA)	None
<i>Number of cars affected</i>	9 million	11 million
<i>EPA fines/ Government Penalties</i>	<a href="#">\$1.2 billion</a>	VW set aside \$7.3 billion EPA maximum fine \$18 billion
<i>Auto Recall Costs &amp; Car Owner lawsuits</i>	<a href="#">\$1.1 billion</a>	If proportional to number of cars, \$1.34 billion.
<i>Shareholder lawsuits</i>	\$25.5 million	Lawsuits being considering in both US and Europe.
<i>Effect on Revenues/Operations</i>	Revenues dropped from \$19.1 billion in 2009 to \$17.8 billion in 2010 and stayed about that level through 2011 and 2012, before rebounding to \$21 billion in 2013.	Not known yet
<i>Effect on stock price</i>	Market Cap dropped 20% between 2009 and 2012, but rebounded in 2013.	Market capitalization down 40% in month since story broke

# The Market has already spoken up..





# But has it spoken soundly?

- The Goldilocks test: The question that we face as investors is whether the market reaction has been too big (over reaction), too small (under reaction) or just right.
- To answer this question, I will start off by
  - ▣ Assuming that the market capitalization on August 31, before the scandal came to light, was right. I will back out the imputed operating income for VW.
  - ▣ Bring in the costs of the scandal into the valuation and revalue the company on September 30, 2015.
  - ▣ Compare this value to the price on September 30, 2015.

## Volkswagen on August 31, 2015 Estimating Imputed Operating Income

### Enterprise Value on 8/31/15

Market capitalization	=	82,000
+ Total Debt	=	41,840
+ Pension Liabilities	=	27,798
- Cash	=	27,670
- Equity in Affiliates	=	23,106
- Financial Svc Net Assets	=	8,886
= Enterprise Value	=	101,069

EV = 101,069

Solve for this = 8,423 million Euros

Imputed Operating Income

Assumed an effective tax rate of 30%

(1 - .30)

This is the reinvestment needed for the growth.

(1 - 0.6% / 5.87%)

Assumed that Volkswagen is a mature firm (grows at the risk free rate) and that it earns a ROIC = Cost of capital

Cost of Capital = 8.29% (.6621) + 1.12% (.3379) = 5.87%

Expected Growth rate in perpetuity = 0.60%

Cost of Equity = Risk free rate + Beta (ERP)  
= 0.6% + 1.14 (7.42%) = 8.29%

### Cost of debt

(Rf Rate + Default Spread) (1 - t) = (0.6% + 1%) (1 - .30) = 1.12%

### Debt Ratio on 8/31/15

Debt / (Debt + Equity) = 33.79%  
Debt to Equity = 51.02%

Risk free rate = German 10-year Euro bond rate = 0.6%

Business	Unlevered beta	Proportion of value	D/E ratio	Levered beta
Automobiles	0.84	87.15%	51.02%	1.1400
Power Engineering	0.89	1.67%	51.02%	1.2079
Financial Services	0.84	11.18%	51.02%	1.1400
<b>VW Beta</b>	<b>0.84</b>	<b>100%</b>	<b>51.02%</b>	<b>1.1412</b>

Region	% of Revenue	ERP
Rest of Europe	41.24%	7.70%
North America	13.64%	6.25%
South America	6.85%	10.73%
Asia-Pacific	18.83%	7.64%
Germany	19.45%	6.25%
<b>ERP for company</b>		<b>7.42%</b>

# The Costs of the Scandal: A Conservative Assessment

1. Fines/Penalties: I will assume that
  - ▣ The EPA penalty will be the maximum (\$18 billion or 16.1 billion Euros) and the penalties from other governments will be an additional 10 billion Euros.
  - ▣ Only half of this cost will be tax deductible.
2. Auto Recall/Lawsuits: VW's auto recall cost will be 1.6 billion Euros and the lawsuits/legal costs will amount to another 2.4 billion Euros, again only half tax deductible.
3. Reputation/Brand Impact: VW will lose 20% of its operating income (about 8% of its sales) for the next five years, before recovering back to pre-crisis trend lines.

# The Post-scandal Valuation of VW

	<i>Assumptions</i>	<i>Value of Equity (billions of Euros)</i>	<i>% under or over valued</i>
<i>Worst Case</i>	Maximum EPA Penalty + 10 billion in Other Government Fines, 4 billion Euros in recall/legal costs, 20% loss in operating income forever, Fines and Legal costs not deductible.	30.10 €	59.47%
<i>Base Case</i>	Maximum EPA Penalty + 10 billion in Other Government Fines, 4 billion Euros in recall/legal costs, 20% loss in operating income for 5 years, Fines and Legal costs only 50% deductible	52.20 €	-8.05%
<i>Better Case</i>	Maximum EPA Penalty + 10 billion in Other Government Fines, 4 billion Euros in recall/legal costs, 20% loss in operating income for 3 years, Fines and Legal costs 100% deductible	58.50 €	-17.95%
<i>Likely Case</i>	Half of maximum EPA Penalty + 5 billion in Other Government Fines, 2 billion Euros in recall/legal costs, 20% loss in operating income for 3 years, Fines and Legal costs 100% deductible	69.10 €	-30.54%
<i>Best Case</i>	Penalties proportionate to Toyota, 20% loss in operating income for 3 years, Fines and Legal costs 100% deductible	73.60 €	-34.78%

# The VW Investment

- The scandal has affected VW's value, but the market reaction looks over wrought.
- The narrative for VW as a company before the scandal was that it was a not-very-imaginative company in a bad business. That remains the narrative.
- The stock looks under priced at its current market capitalization of roughly 48 billion Euros.
- The preferred shares have been pushed down more than the common shares, but the latter give you a chance to play the control game, more important now than before the scandal.

# The End Game



- I bought Volkswagen's ordinary shares because I think that after the smoke clears and another scandal emerges that draws attention away, the market will adjust.
- I recognize that the next few months (perhaps even years) will be rocky, with more bad news and abysmally bad bottom lines (profits).