

Reserving in Uncertain Economic & Legislative Conditions

Compare and Contrast

California Workers Compensation and
Argentina Auto Liability

November 15, 2016

Orlando, FL

CAS Annual Meeting

Alejandro Ortega, FCAS

Mark Priven, FCAS - Bickmore

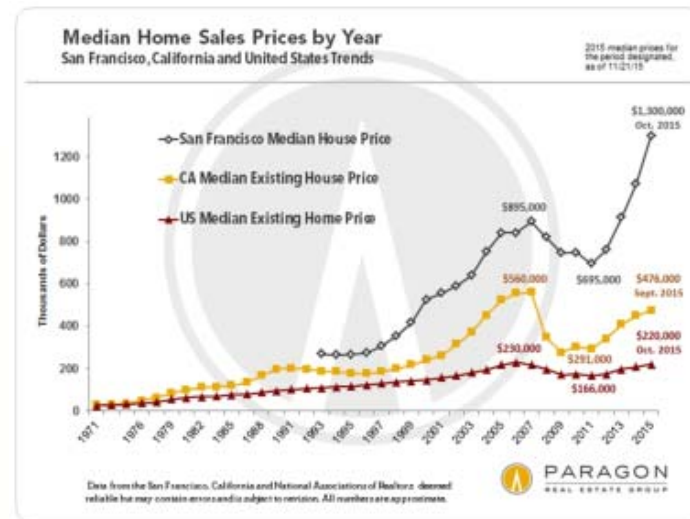
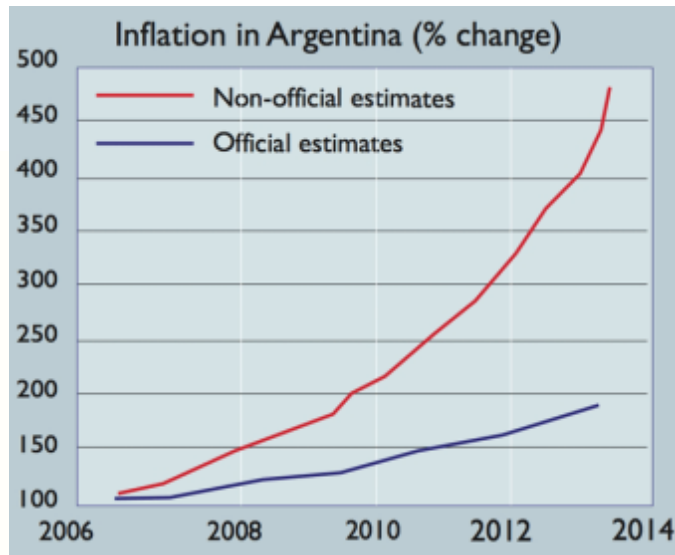


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Argentina & California: Compare / Contrast



Reserving in Uncertain Economic Conditions

Argentina
Auto Liability



Alejandro Ortega, FCAS, CFA



Inflation

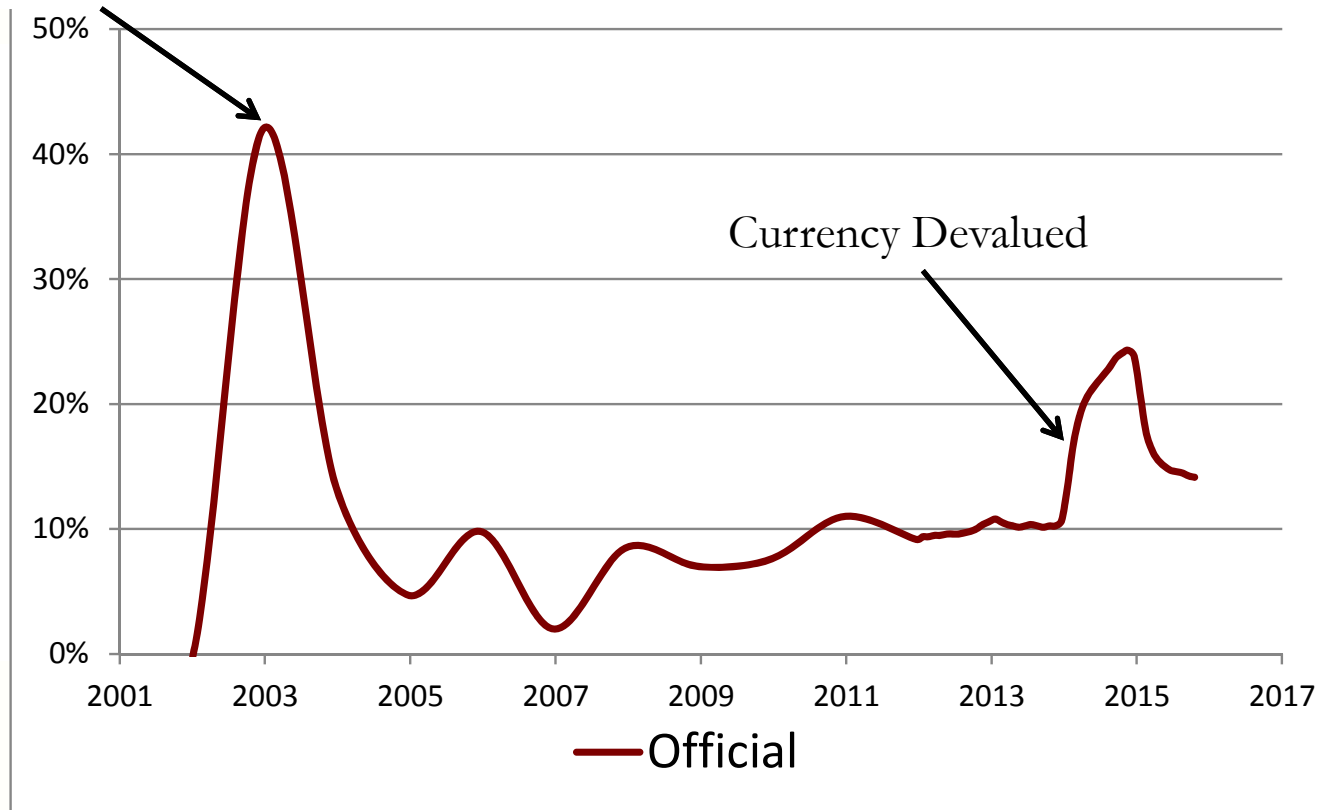
	Low Inflation	High Inflation
Short Tail	US First Party Auto US Personal Property	Venezuela – All products Argentina – Personal Property
Long Tail	US Casualty US (x-CA) Workers Comp	Argentina Auto California Workers Comp



Historical Inflation Argentina

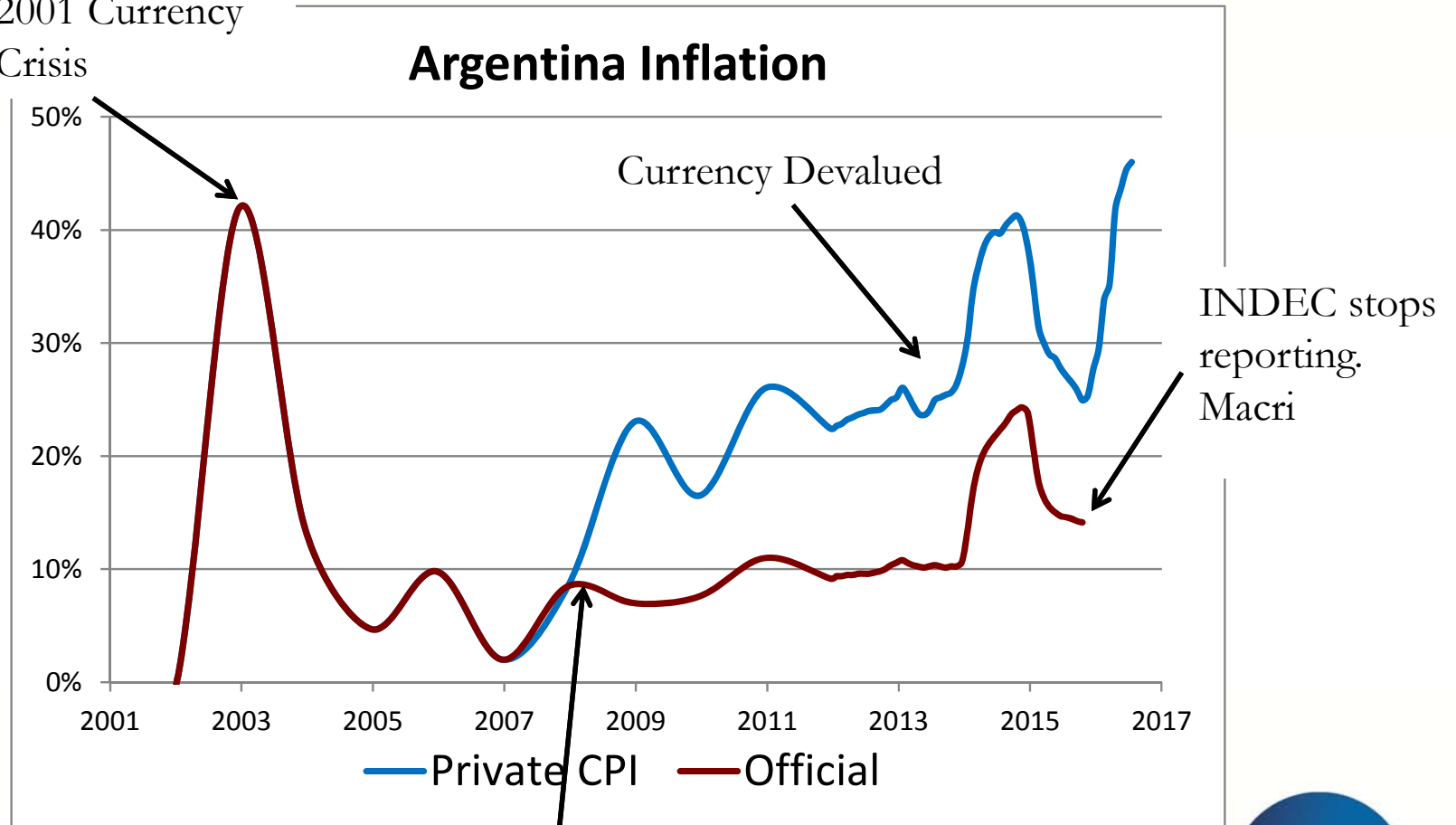
2001 Currency
Crisis

Argentina Inflation



Historical Inflation Argentina

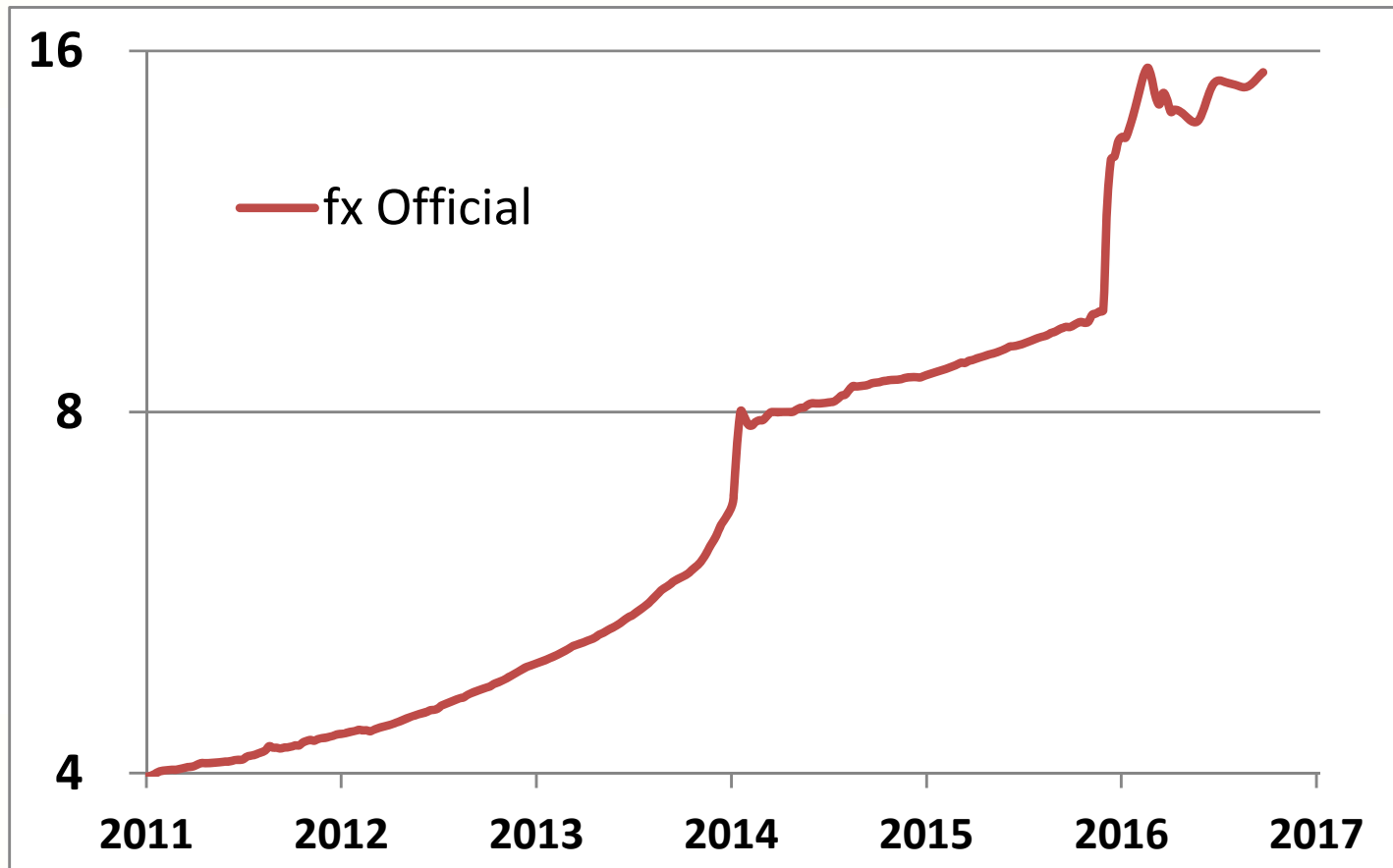
2001 Currency
Crisis



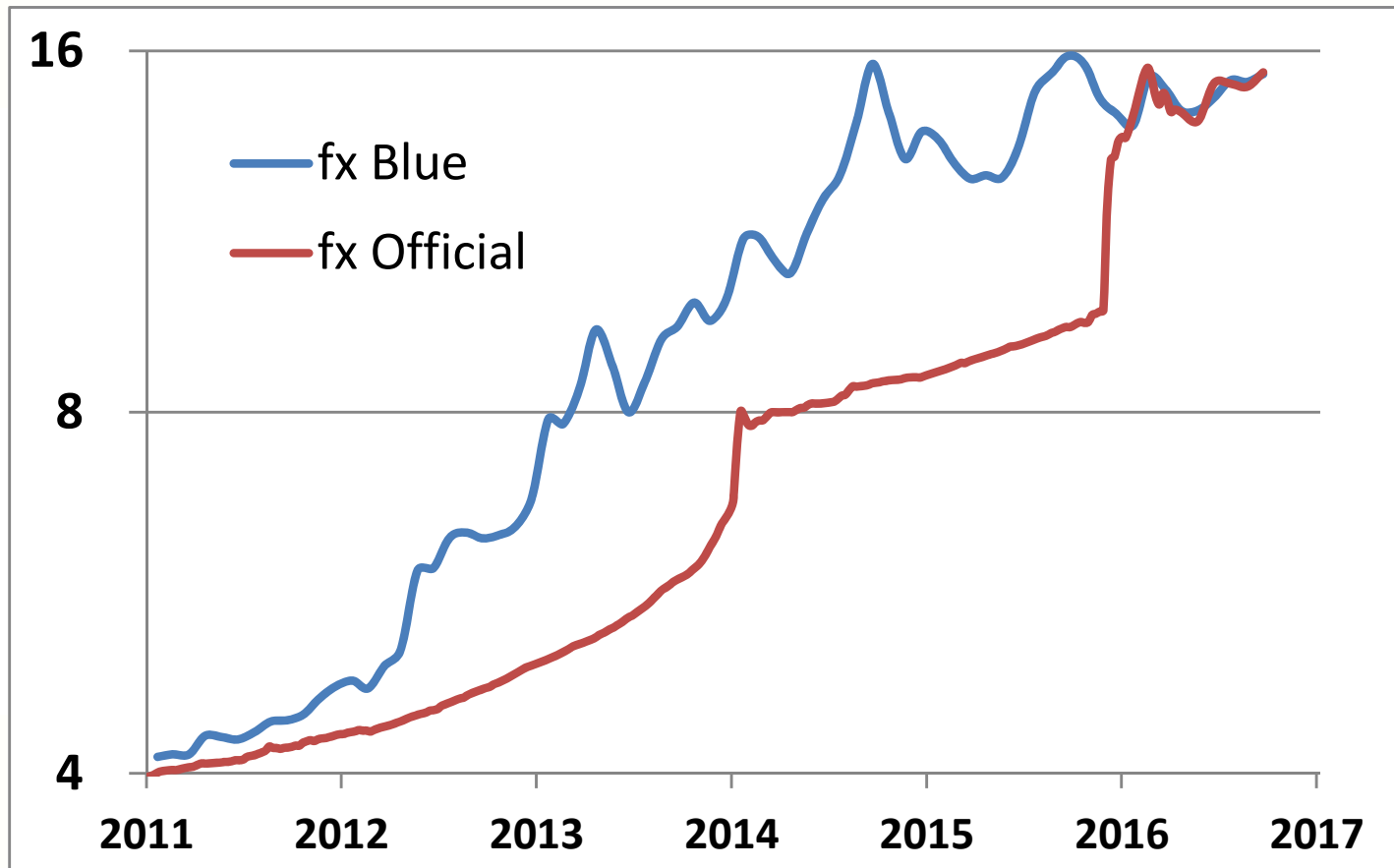
Government Reporting
no longer reliable



Historical Exchange Rate Argentina Peso to USD



Historical Exchange Rate Argentina Peso to USD

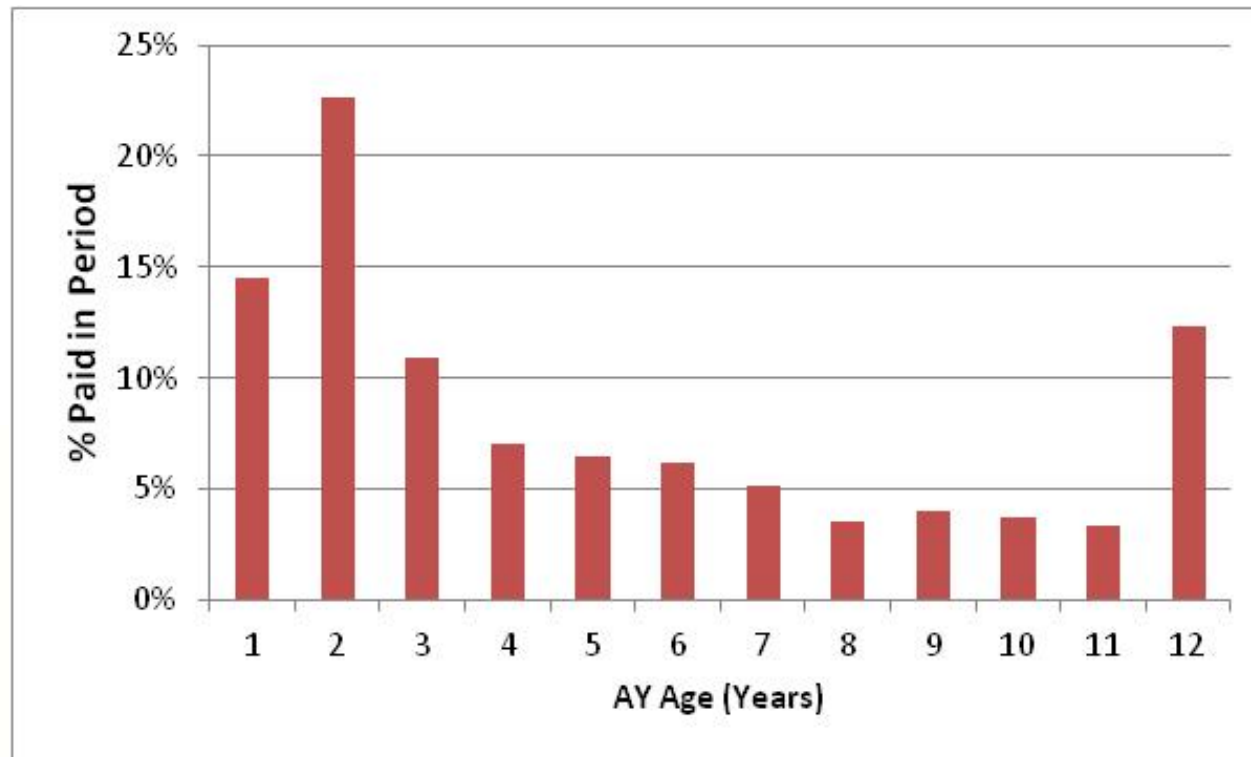


Argentina & California: Great Wine!!



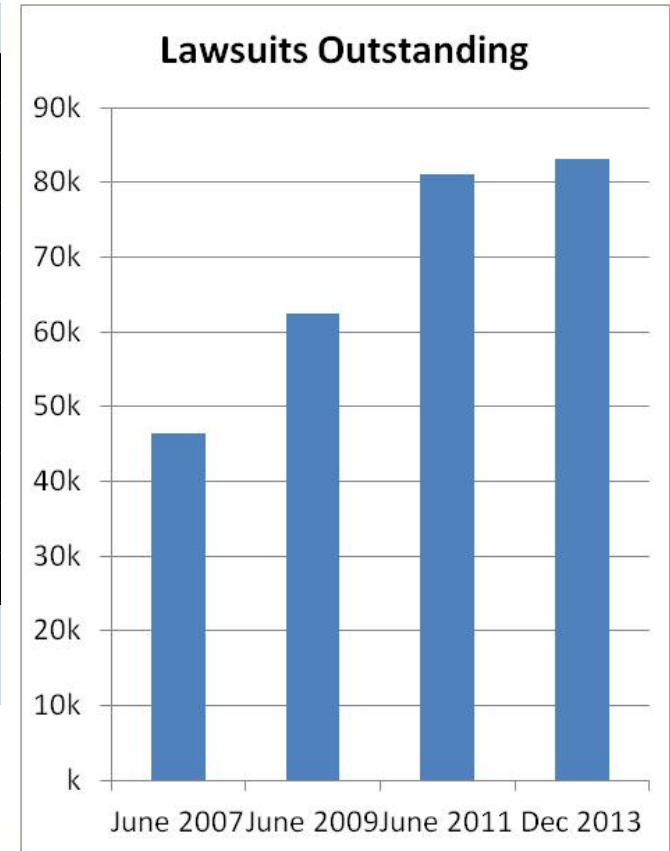
High Inflation – Long Tail

- Auto – Third Party Bodily Injury
- First Party is short tailed
- The Inflation makes the tail even longer



Drivers of the Tail – Lawsuits Outstanding

Company	June 2007	June 2009	June 2011	Dec 2013
Federacion Patronal	6,842	9,962	13,939	16,818
Caja Seguros	7,637	11,942	15,864	12,576
Provincia	6,222	7,763	8,242	7,691
QBE LA Buenos Aires	4,552	5,163	5,546	7,335
San Cristobal	2,978	4,637	5,396	6,526
Zurich Argentina	3,506	4,553	7,776	6,207
Seguros Rivadavia	2,640	3,109	3,955	6,104
Liderar	2,304	2,812	3,836	5,485
Aseg. Federal Arg	1,298	2,578	3,387	5,288
Segunda C.C.L	3,792	4,574	5,064	4,561
La Meridional (AIG)	4,647	5,348	8,166	4,533
Total	46,418	62,441	81,171	83,124



- Litigious Culture in Argentina
- Growing since ~2007



Assumptions of Chainladder

Thomas Mack

1. **Expected Incremental Losses** are **proportional** to losses Reported to Date
2. Losses in AY are **independent** of losses in other accident years
3. Variance of incremental losses is **proportional** to losses reported to date

- High and Changing Inflation produces Calendar Year Effect
- Litigious Growth also a CY Effect
- Assumptions 1 & 2 are violated



Assumptions of Chainladder

- Chainladder implicitly takes the inflation in the triangle and forecasts from there
- When inflation is changing – this is not appropriate
- We will end up with a methodology that allows us to forecast different levels of inflation



How to set Reserves

- Adjust Paid Triangle for Inflation
- Adjust Incurred Triangle for Inflation
- Paid Only Triangle
- Average Severity to Date
- Future Closed Paid Claims x Future Severity

Closed Paid Claims



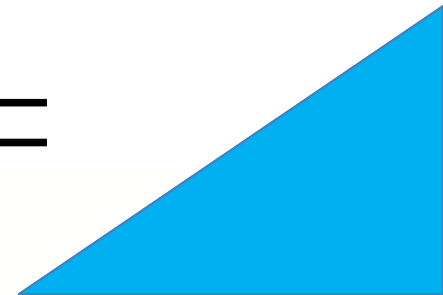
X

Severity



=

Unpaid Losses



Fisher Lange

- Closed Claims are easy to estimate
- Allows different assumptions for future inflation (and interest)
- Granular Result
- Sensitivity Testing vs Case Reserves

Closed Paid Claims



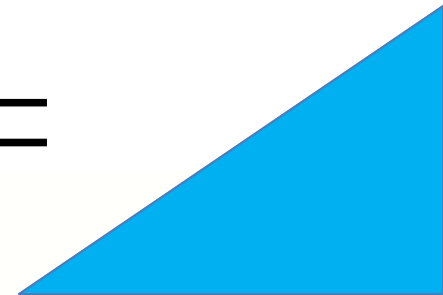
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Severity



=

Unpaid Losses



Closed Claims

Forecast the Following

- Newly Reported Claims at each age
- % of Claims Closed Without Payment (CWP)
- % of Claims Closed With Amount (eg. Paid)

Closed Paid Claims



Severity

Underlying Components of Severity:

- % Disability awarded by the Court (similar to WC)
- Cost of a Point of Disability in each Jurisdiction (2,500 – 4,000 pesos)
- The final cost of the claim is proportional the product of these two
- Four General Categories of a Claim:
 - Indemnity
 - Treatment Expenses
 - Court and Attorney Fees
 - Interest and Inflation



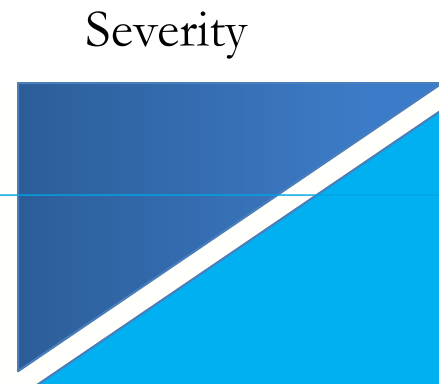
Severity

Interest Costs

- In addition to the base cost of the claim, the insurer must pay interest from the date of the accident
- A Claim occurring in 2009, and closing in 2014, we would pay 5 years of interest

Inflation (Calendar Year Trend)

- The base cost of this claim is based on the **Cost per Point** in **2014** – not, 2009



Severity

- We are paying for the time value of money – twice
- Our 2009 claim, in 2013 is 60 months old
- By waiting one more year to close it in 2014:
 - We pay an additional year of interest (~12%)
 - Cost of a Point is also increased (~9%)
 - Total cost of claim goes up about 22%

Severity



Severity

Forecasting Severity

- Forecast Severity on the Diagonal
- Forecast Down the Triangle using Inflation (CY Trend)
- Reasonability Check – going Across the Triangle for Interest, and Development Year Trend

Severity



Severity

Pesos (000)

AY	12	24	36	48	60	72	84	96	108	120	132	144
2002				35	47	124	28	44	55	38	110	265
2003			57	144	51	24	37	127	55	107	241	292
2004		29	50	64	75	95	140	89	221	217	265	321
2005	10	18	55	68	103	74	70	164	193	238	291	353
2006	9	19	65	74	101	117	162	175	213	262	320	388
2007	11	17	43	70	95	182	155	193	234	288	352	427
2008	9	19	41	69	147	144	174	212	257	317	388	470
2009	7	20	49	73	128	158	191	233	283	349	426	517
2010	11	20	58	86	141	174	210	257	311	384	469	569
2011	10	24	65	95	155	192	231	282	342	422	516	626
2012	11	28	71	104	171	211	254	311	377	465	568	688
2013	13	30	78	114	188	232	280	342	414	511	624	757

Historical Severity
 Selected Diagonal Severity
 Forecast Severity

All scaled by a factor

Severity



Closed Paid Claims

AY	12	24	36	48	60	72	84	96	108	120	132	144
2002	-	788	28	15	8	4	9	3	3	2	1	-
2003	623	323	51	8	16	11	11	2	5	5	4	3
2004	1,045	474	50	41	39	15	16	8	2	3	2	7
2005	1,444	855	129	66	37	25	22	16	17	9	7	20
2006	2,085	1,334	195	91	45	40	49	23	20	15	11	33
2007	2,705	1,436	219	78	83	60	17	23	21	16	12	36
2008	2,462	1,682	208	183	51	53	33	19	17	13	10	29
2009	2,007	1,309	317	134	92	51	35	20	18	14	10	31
2010	1,533	1,572	195	128	60	47	32	18	17	13	9	28
2011	1,913	1,182	247	99	55	43	30	17	16	12	9	26
2012	1,941	1,477	238	119	66	52	36	20	19	14	10	31
2013	2,374	1,463	254	127	70	55	38	21	20	15	11	33

Closed Paid Claims



Historical Closed Paid Claims
Forecast Severity Closed Paid Claims

All scaled by a factor

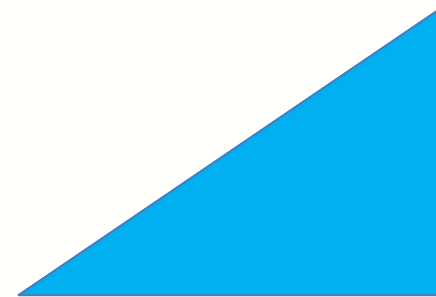


Unpaid Losses

Reasonability Checks are Performed

- Compare Ultimate Losses to Prior Analysis
- Look at Loss per Exposure across accident years
- Compare Unpaid Losses to Case Reserves
- This method does not calculate IBNR, but rather Unpaid Losses

Unpaid Losses



January 2014

- The Peso was losing about 7% per year against the USD from 2009-2011; or about 0.5% per month
- 2012: lost 1% per month
- 2013: lost 2% per month
- 2014 – January: 19%
 - Short Term Bonds went from 18% to 25%
- This sudden devaluation leads to a revision of the future inflation and interest assumptions
- This model allows one to immediately have an estimate of the Unpaid Losses with the updated interest and inflation assumptions.



Asset Liability Management

- The liability is almost exclusively Pesos
- Yet the high leverage in inflation and interest makes it tricky to hold pesos
- A strategy of holding USD, USD backed assets, inflation linked bonds, and short term fixed bonds
- This strategy is a strong hedge against both devaluation, and high inflation



High Inflation Environment

- Argentina has additional complications due to changing legal environment
- High Inflation is typically associated with a weak currency, and changing inflation
- Sometimes it is associated with Social Changes (eg. higher litigiousness)
- Understanding the underlying drivers of Claim Costs is Key
- Fisher-Lange allows you to forecast different levels of inflation and interest
- Great Tool for Sensitivity Testing



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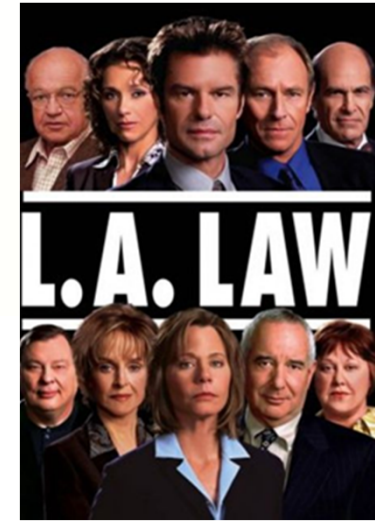
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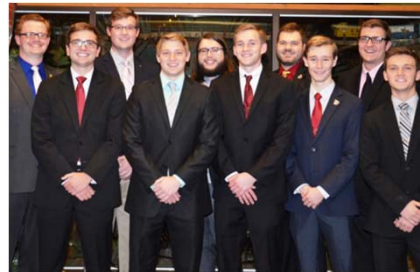


CA WC – Basic Facts



TEMPORARY

PERMANENT



WAMIDACT



The Workers' Compensation Roller Coaster



Source: WCIRB aggregate data calls



The Workers' Compensation Roller Coaster

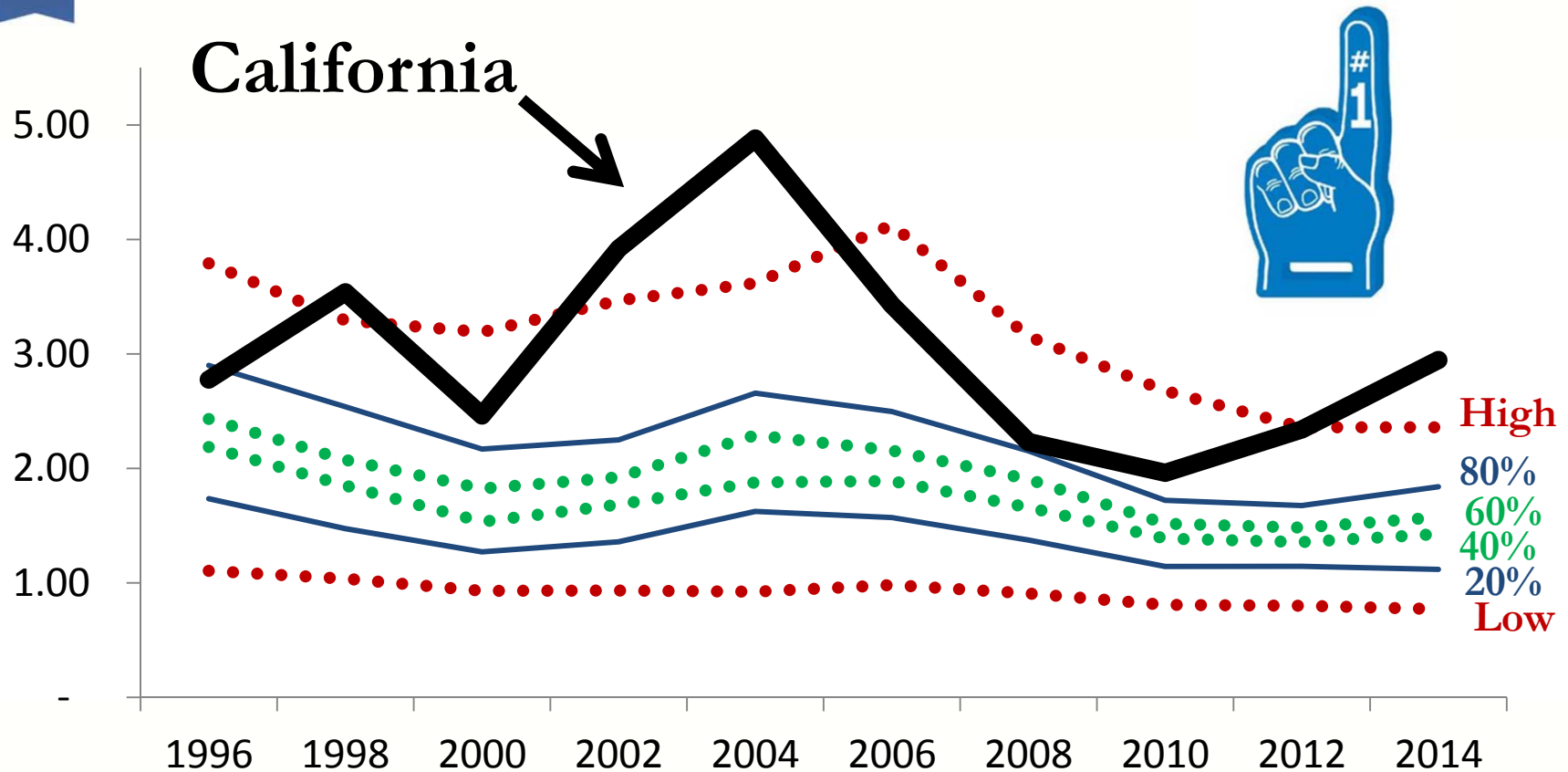
California Workers' Compensation Industry Average Charged Rate per \$100 of Payroll



WCIRB Report on Insurer Experience 6/30/16



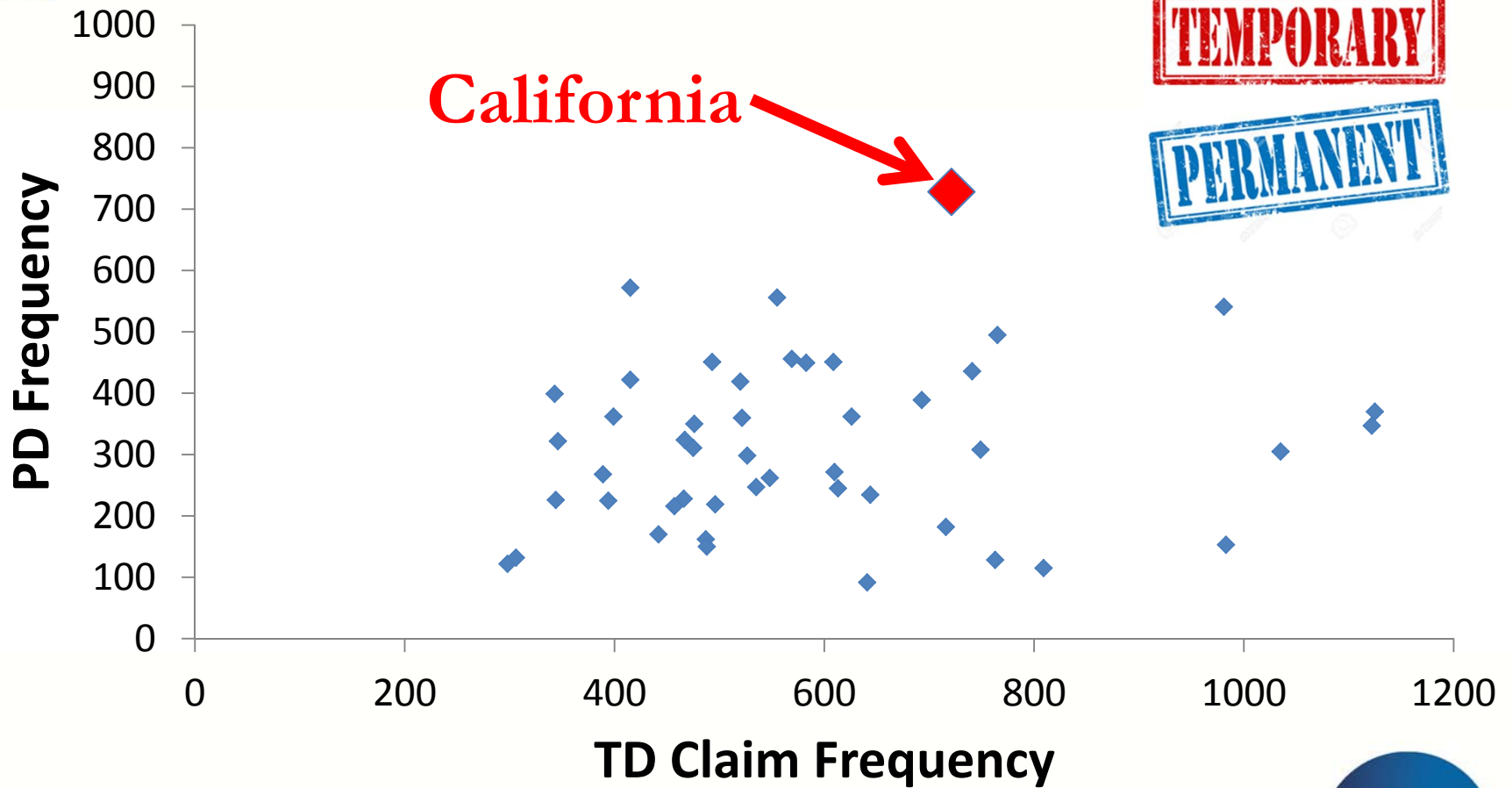
CA WC – We Are #1: Avg. Loss Rate



*State of Oregon DCBS Rankings: Adjusted to CA industry mix



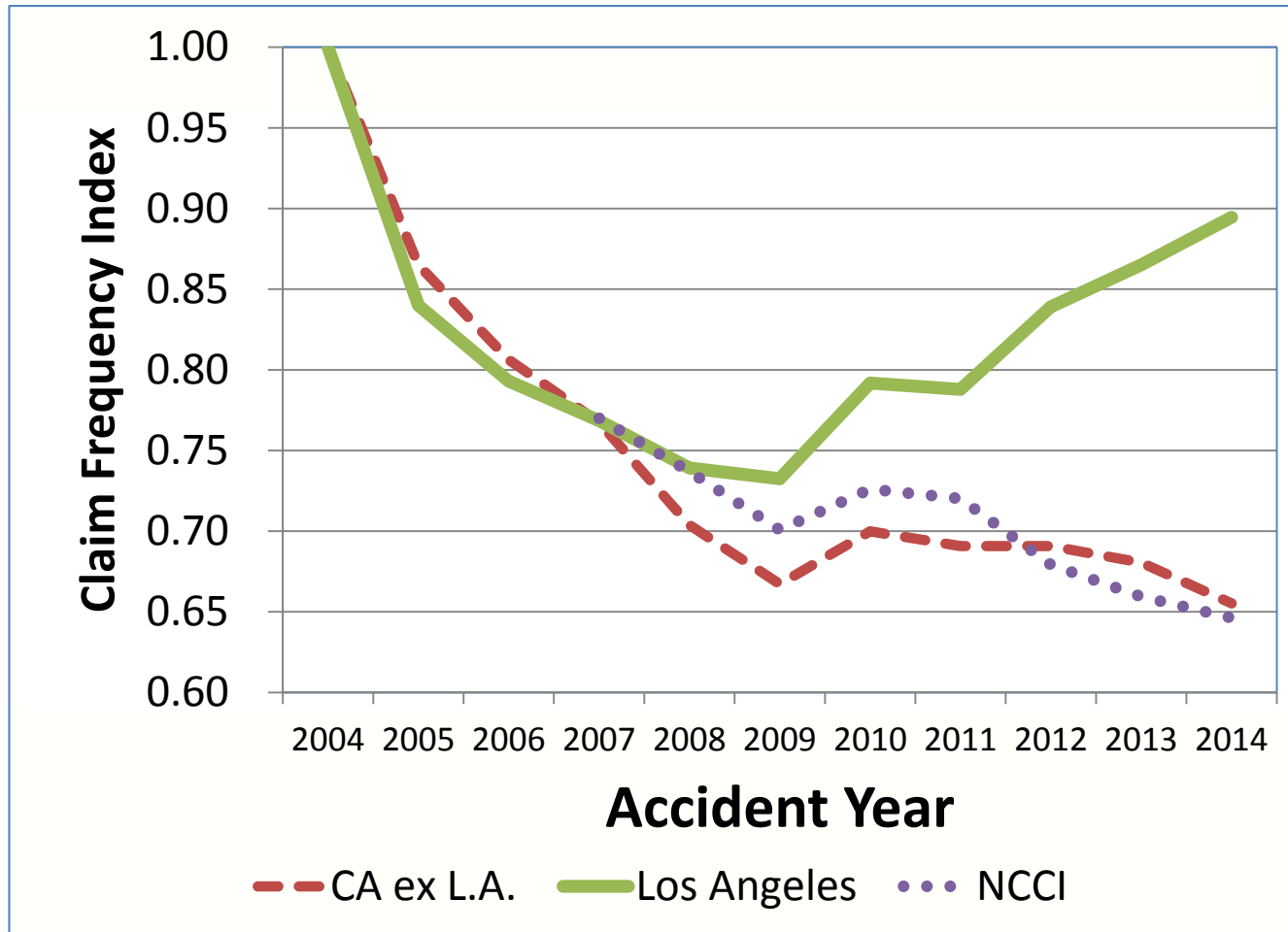
CA WC – “Permanent” Frequency Problem?



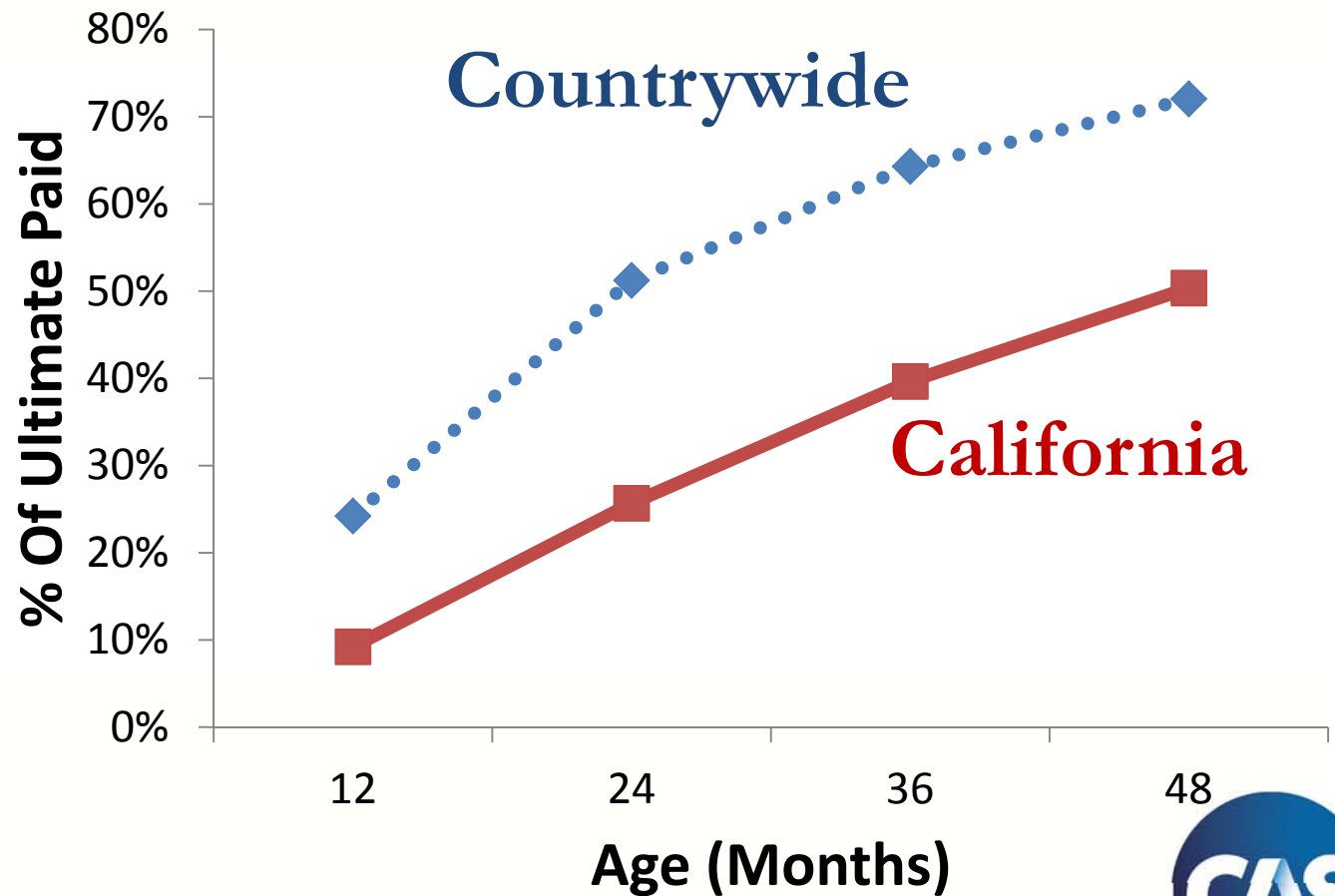
*PY 2012/13: NCCI Annual Statistical Bulletin 2016



CA WC – 2 Californias?

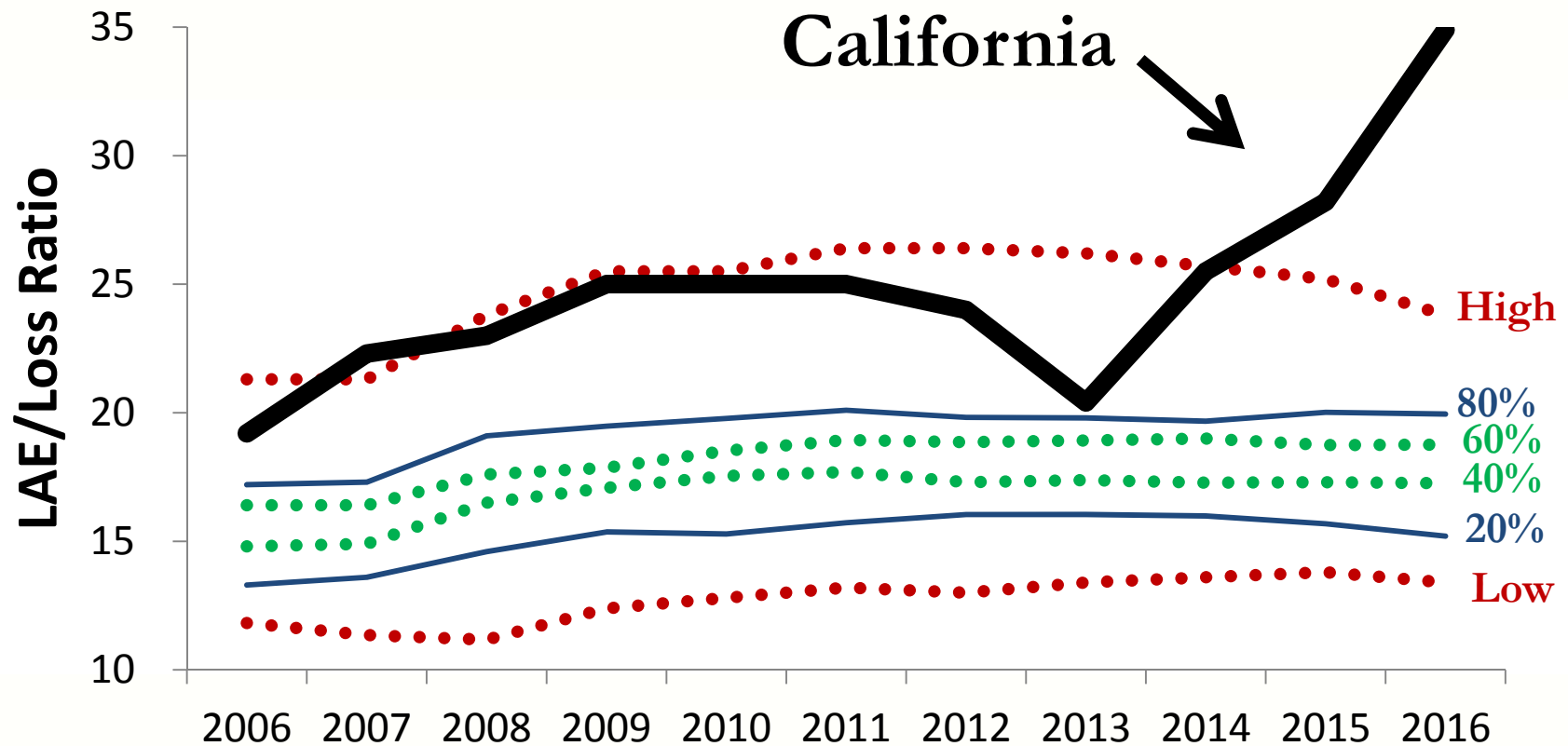


CA WC – Long Tail!



*NCCI Annual Statistical Bulletin 2016

“WAMIDACT” Compensation System

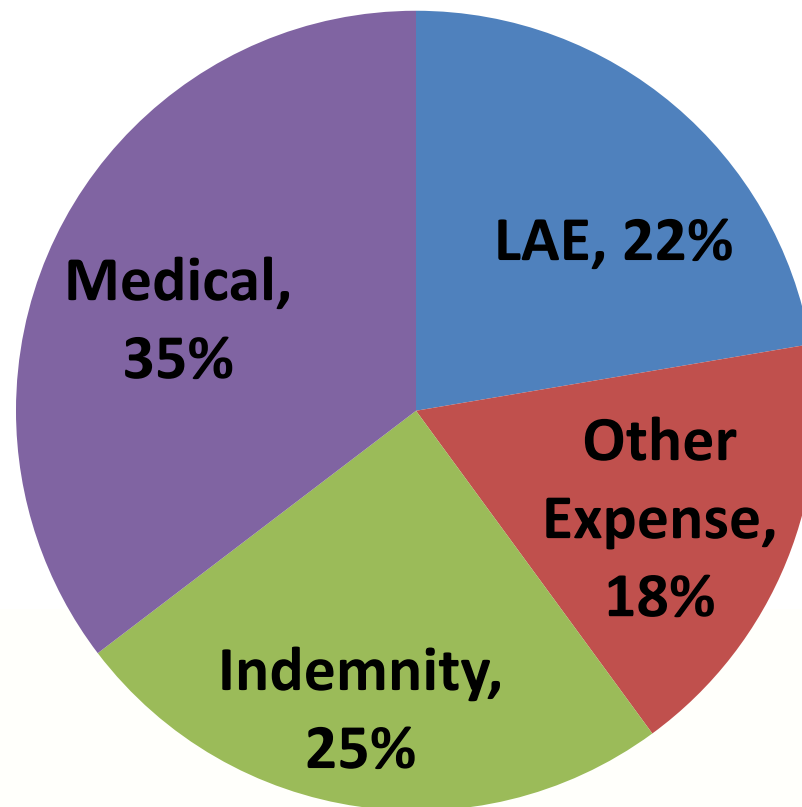


*NCCI Annual Statistical Bulletin



“WAMIDACT” Compensation System

Cost Breakdown



*Loss & LAE: 1/1/17 WCIRB Rate Filing
Other Expense: CY 2015 Payments (WCIRB)



CA “Workers” Compensation

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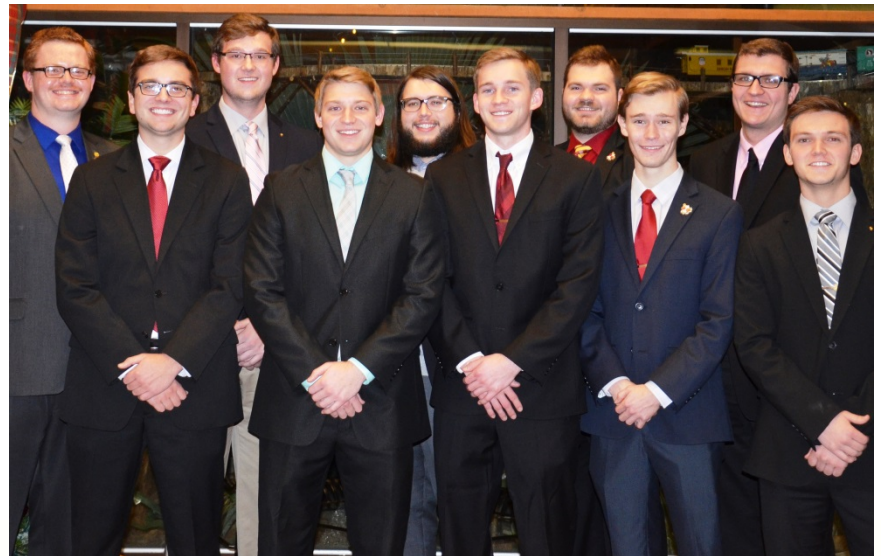
*Compensation
System*



CA Workers' Compensation

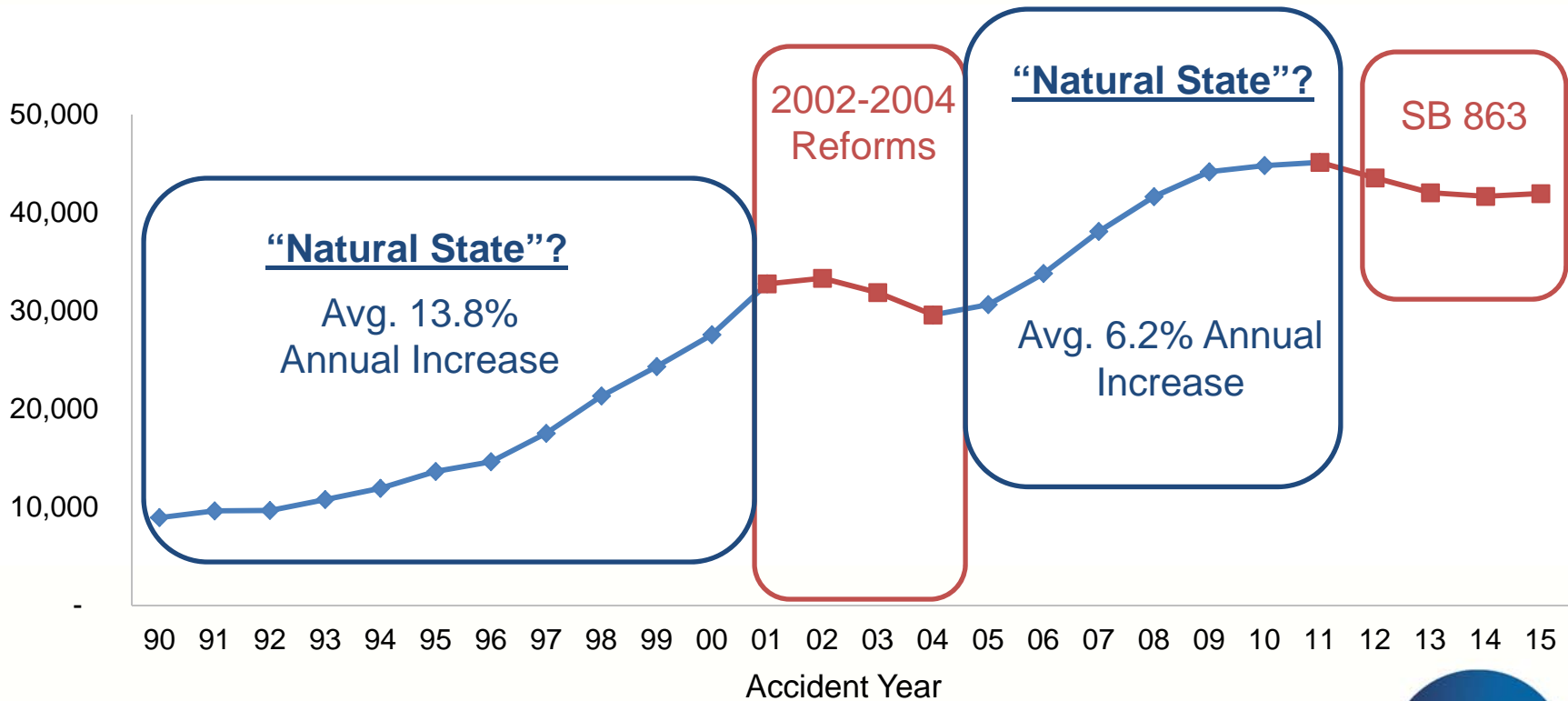
Post-Reform

Natural State



Med. Inflation Periods of Significant Increase And Periods of Decline

Average Ultimate Medical per Indemnity Claim



Source: WCIRB 1/1/17 Rate Filing (Medical includes MCC)



Argentina & California: Reform & Politicians



CA WC – A Changing System

- Major System Reforms
 - 2002 through 2004 reforms
 - Senate Bill No. 863 (2012)
 - Impact both frequency and severity
 - Both CY and AY impacts
- Volatility Makes Traditional Methods Inaccurate



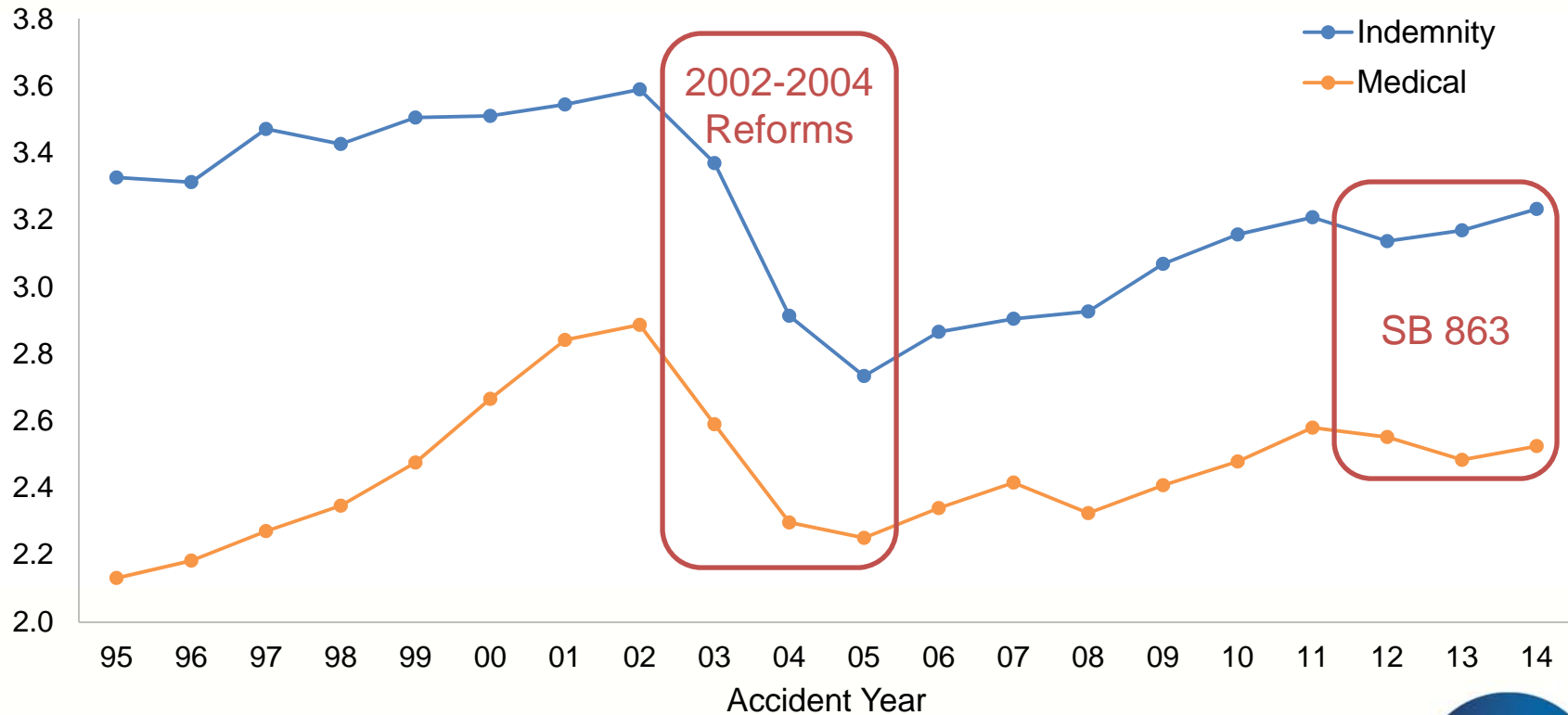
CA WC – What Were the Reforms?

- 2002-2004
 - Physician Presumption of Correctness
 - Medical Fee Schedule
 - Standards for Medical Treatment: ACOEM Guidelines
 - Basis for PD Ratings: AMA Guides
- Senate Bill No. 863 (2012)
 - Increase PD Benefits
 - Medical Dispute Resolution: Independent Medical Review, Liens
 - Transition to RBRVS



Paid Loss Development Highly Impacted by System Reforms

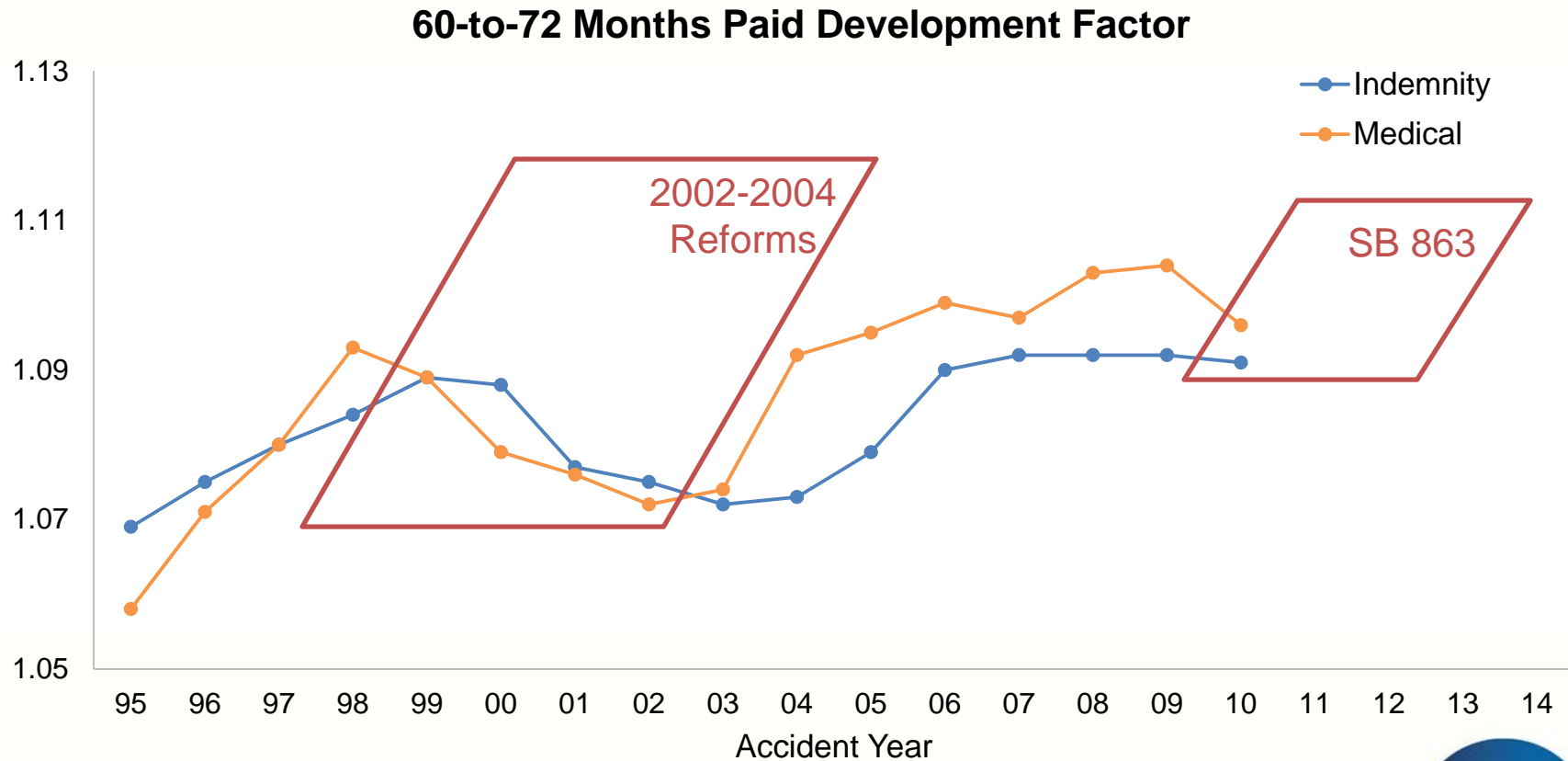
12-to-24 Months Paid Development Factor



Source: WCIRB aggregate data calls



Reforms Impact Development on Older Years



Source: WCIRB aggregate data calls

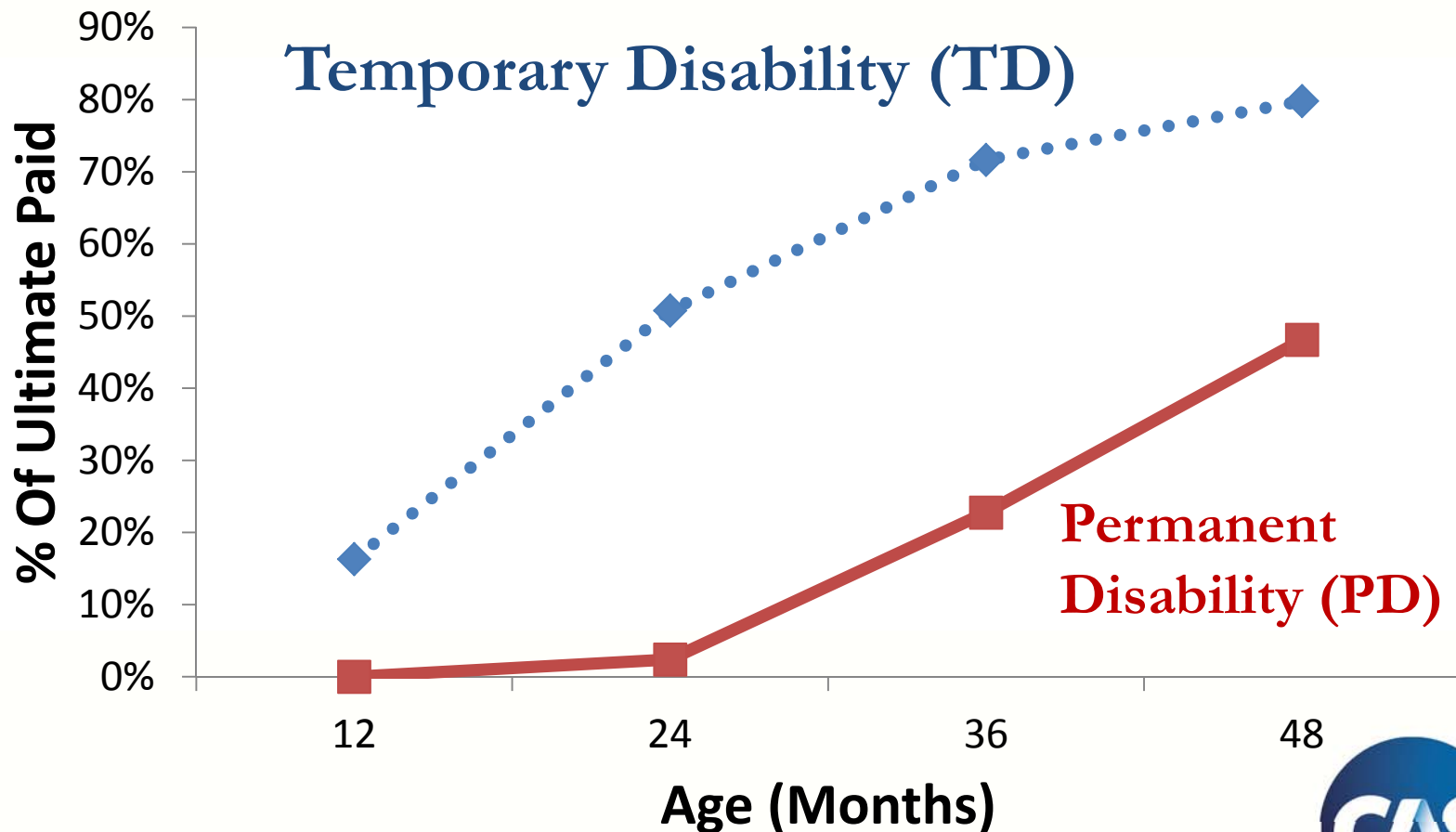


Developing in a Changing Environment

- Reforms Distort Historical LDF Triangles
 - Mix of pre & post-reform data
- WCIRB Solution: Adjust LDFs for Major Changes
 - Indemnity – analyze changes by type of benefit and timing of benefit payments
 - Medical – “on-level” pre-reform payments in LDF
- Adjusted Triangles Now at Comparable Level

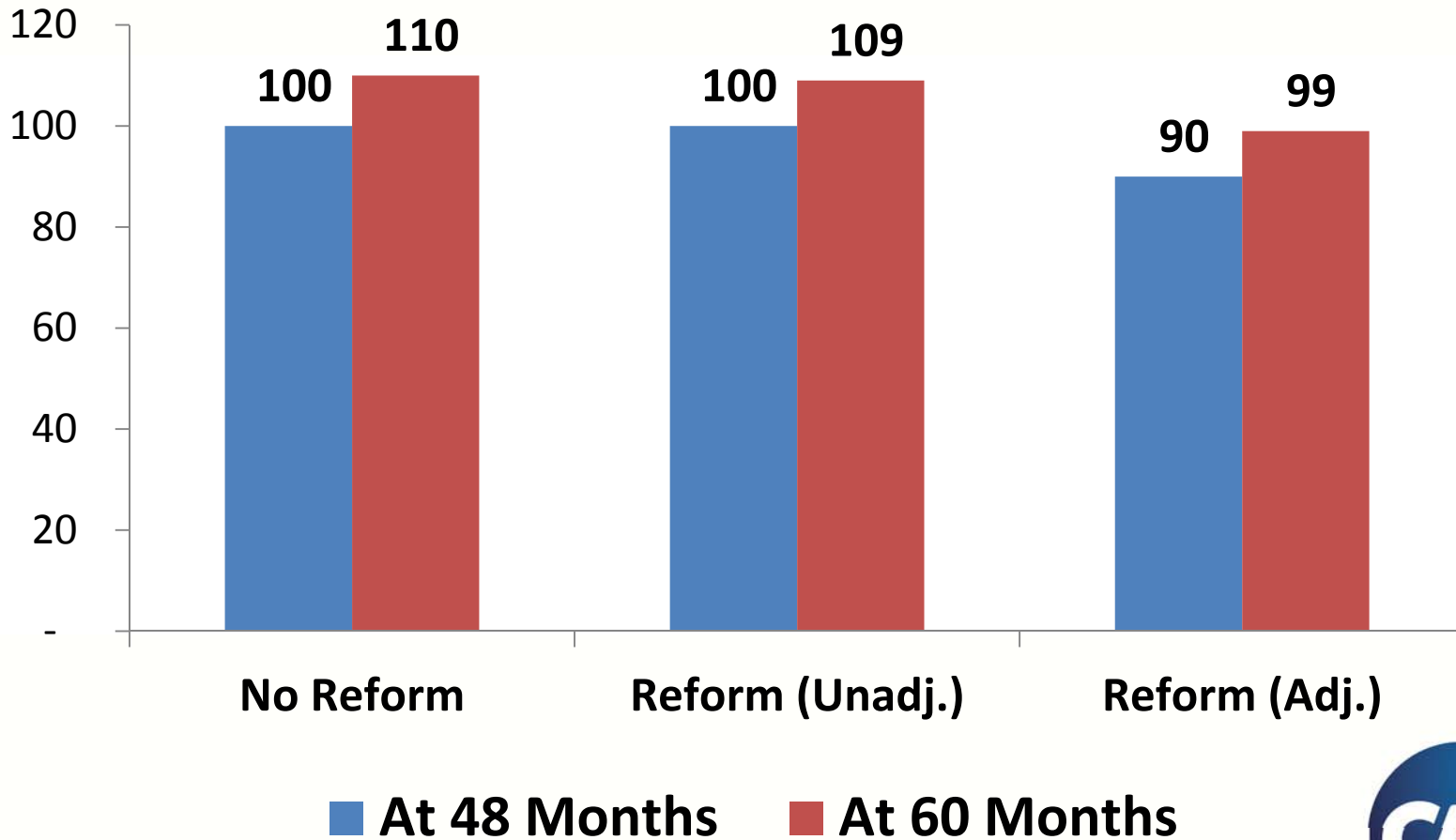


CA WC – Re-Weighting Indemnity



*WCIRB Impact of SB 863 on Loss Development Patterns

CA WC – On-Level Medical

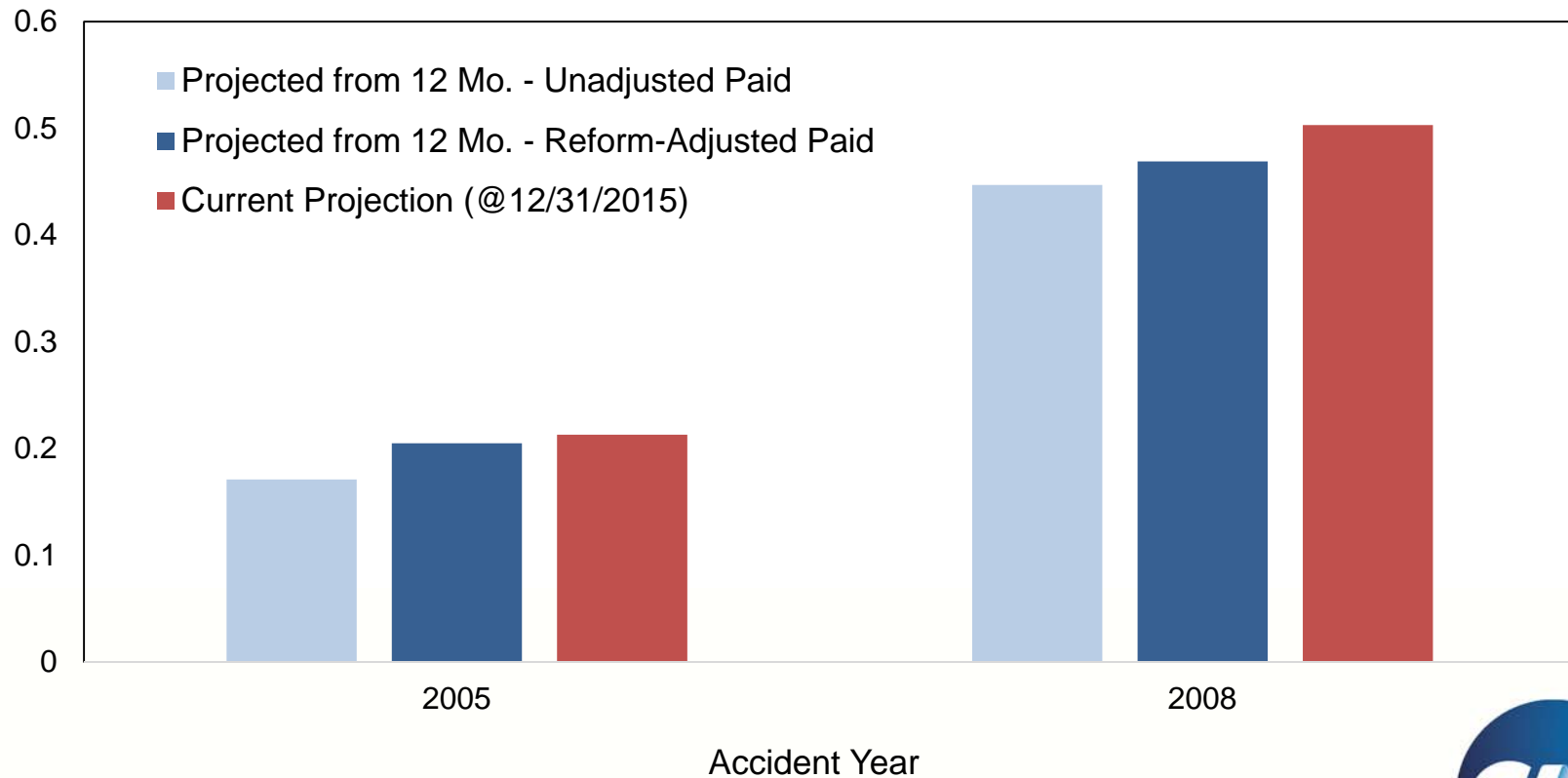


*Example



Reform Adjustments Have Increased Accuracy of Projection

Projected Ultimate Medical Loss Ratios



Source: WCIRB rate filings and Actuarial Committee agendas



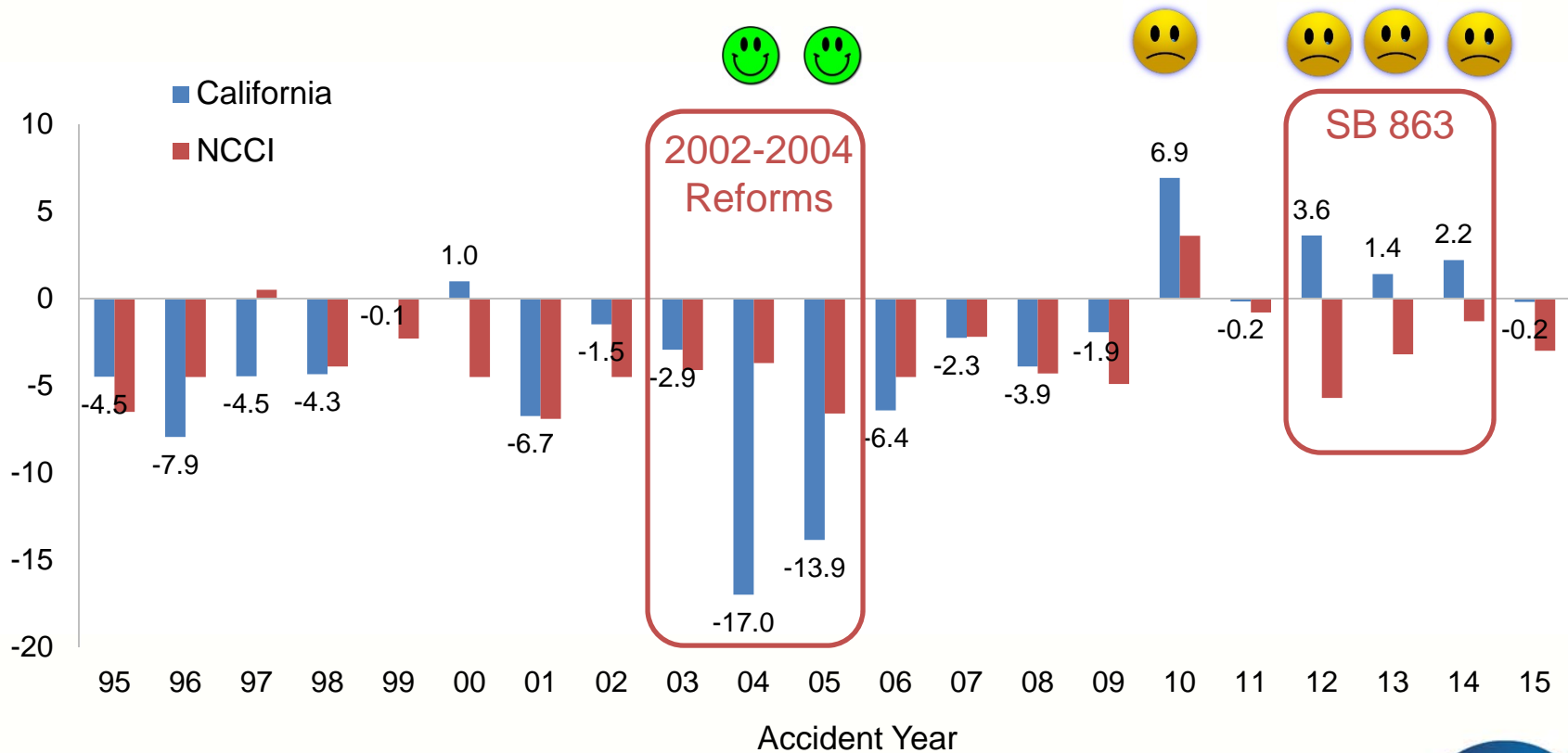
Trending in a Changing Environment

- Volatility Affects Historical Loss Ratio Trend
 - Trends reversing direction!
- WCIRB Solution: Project Separate Frequency & Severity Trends
- Frequency Model Projection
 - Modeled with benefit changes & economic conditions
- Severity Projections
 - Analysis of short and long-term rates
- Always Important to Consider Environment



Changes in Benefits Correlated with Shifts in Claim Frequency

Annual % Change in Indemnity Claim Frequency

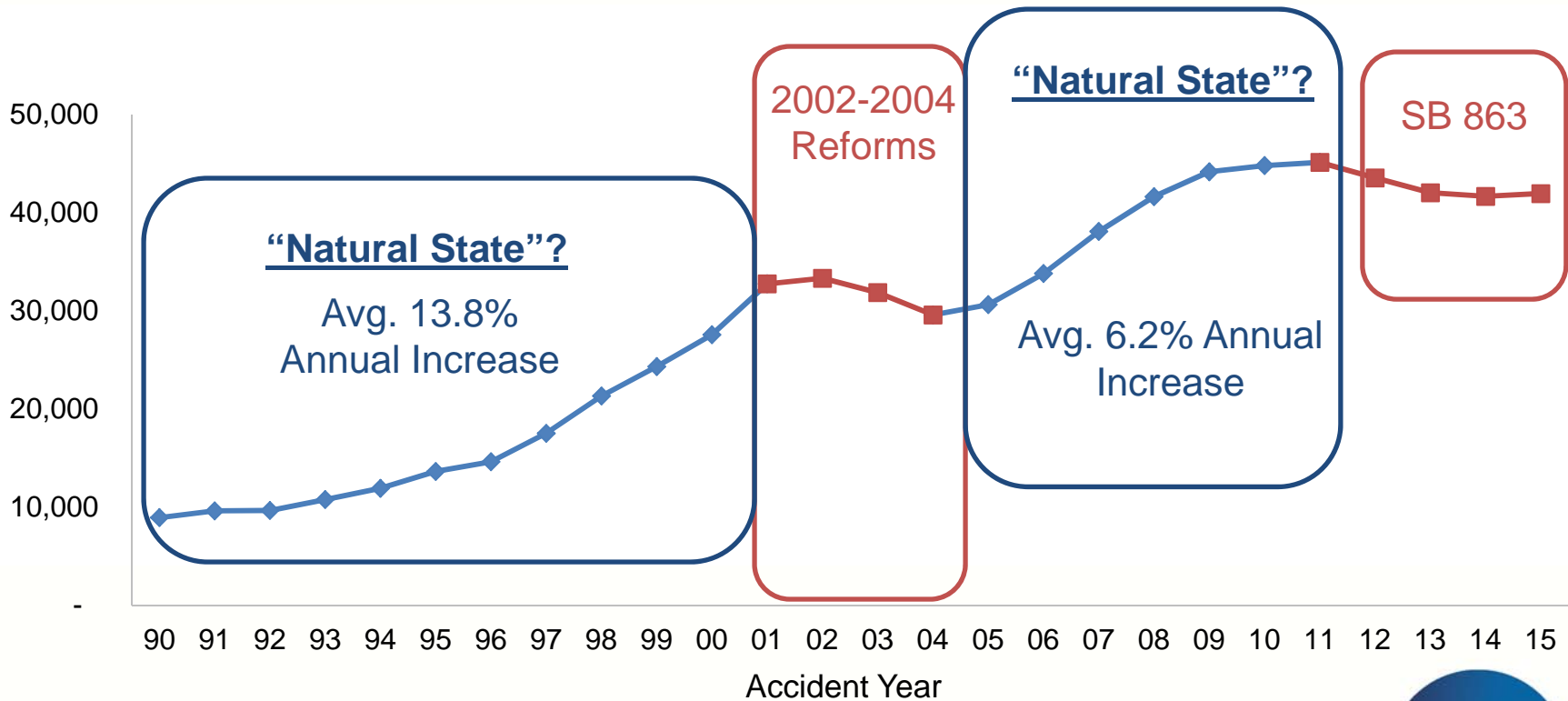


Source: California data from WCIRB 1/1/17 Rate Filing. NCCI data from WCIRB State of the System 2016.



Med. Inflation Periods of Significant Increase And Periods of Decline

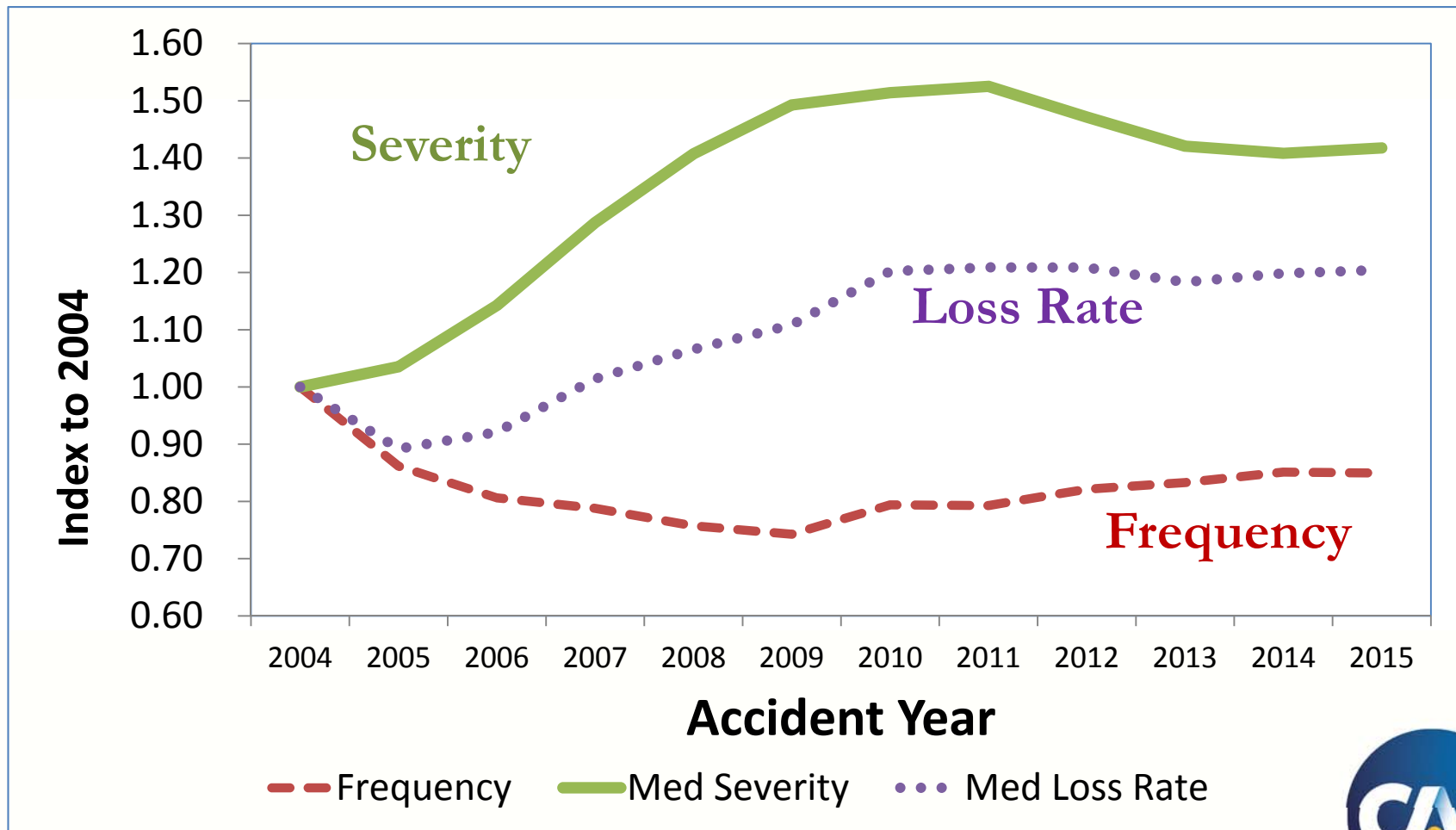
Average Ultimate Medical per Indemnity Claim



Source: WCIRB 1/1/17 Rate Filing (Medical includes MCC)



Trending Frequency & Severity



Argentina & California: Sports & Recreation



California WC vs Argentina Auto

● Differences

- The US is more regulated than Latin America
- The US doesn't have high economic inflation
- WC is longer tail than Auto
- Difference in claimants, different incentives

● Similarities

- Both jurisdictions are subject to inflation: California has high social inflation, while Argentina has high economic inflation
- Both lines of business are casualty (rather than property)
- Both jurisdictions are subject to frequent changes in regulation (e.g. 2002 to 2004 reforms and litigious culture in Argentina, growing since ~2007)
- Economic status of claimant plays is a big driver of filing for the claim
- Difficult to Forecast Trend



Why Traditional Methods Fail

- Assumptions of Chain ladder Thomas Mack
 1. Expected Incremental Losses are proportional to losses Reported to Date
 2. Losses in AY are independent of losses in other accident years
 3. Variance of incremental losses is proportional to losses reported to date
- High and Changing Inflation produces Calendar Year Effect
- Litigious Growth also a CY Effect
- Reforms that impact open claims can also have a CY Effect
- Assumptions 1 & 2 are violated



Why Traditional Methods Fail

- Trending Frequency & Severity Separately Assumes they are Independent
- Some Reforms or Systemic Changes Result in Impacts that Cause Frequency & Severity to be Correlated
- Mixed Loss Levels within an Accident Year mean we can't use the same LDFs for each AY



Conclusions

- Two different solutions to solve a similar problem
 1. Using a modified Fisher Lange methods that predicts frequency and severity separately
 2. Adjusting LDFs for major changes on indemnity and medical
- The solutions suggest potential strategies, including
 - Modifying historical losses for systemic changes
 - Modeling frequency and severity separately
- The solutions suggest separating the trends, data and results by coverage to link them to economic drivers
 1. For WC California, trends are different between medical and indemnity and interact with different economic drivers (inflation for medical and unemployment for indemnity)
 2. For Argentina Auto, trends are different between lawsuits and administrative claims; as well as by coverage





Discussion



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Appendix Slides



CA WC Reforms – 2002 through 2004

- AB 749 (2002)
 - Increased indemnity benefits
 - Repeal of presumption of correctness given to primary treating physician (Minniear)
- AB 227 & SB 228 (2003)
 - Changes to voc rehab benefits
 - Reductions to medical fee schedules
 - Established Medical Treatment Utilization Schedule
 - Limited # of chiropractic or PT visits
- SB 899 (2004)
 - Limited duration of TD
 - New PDRS & changes to PD benefits
 - Established medical provider networks



CA WC Reforms – SB 863

- SB 863 (2012)
 - Increased PD benefits
 - Changes to PD ratings
 - Reductions in some medical fees
 - Established lien filing fee & statute of limitations
 - Established independent medical review and independent bill review processes
 - New physician fee schedule based on RBRVS

