Technical Work Group

Spring Approach to Modelling 2014

15th January 2014

Technical Work Group

Model Smoothing

15th January 2014

** Slides Updated since last TWG meeting **

Model Smoothing - Background

- At DESC meeting 13th November results were presented on the evaluation of model smoothing

- In summary, model smoothing continues to provide less volatile models which DESC confirmed is still its priority

- DESC confirmed 3 years of models should continue to be used but were interested in testing the weightings used for each of the 3 years

- The current approach applies weightings of 34:33:33

- DESC asked if results could be produced using an approach of 50:30:20 where '50' is the most recent year and '20' the oldest

- DESC suggested results for Band 02b could be reviewed

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Model Smoothing - Background

- Factors to consider….

- During the model smoothing stage an assessment is made on whether to apply summer reductions and/or CWV cut-off to the final smoothed model

- When the weightings are amended this can lead to a change the model characteristics, i.e. those with cut-offs and summer reductions

Model Smoothing – Volatility Analysis 1

- ## Spring 2013

Analysis Period	Current Model Smoothing Approach		Proposed Model Smoothing Approach	
	Spring 2012	Spring 2013	Spring 2012	Spring 2013
09/10	33%		20%	
10/11	33%	33%	30%	20%
11/12	34%	33%	50%	30%
12/13		34%		50%

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Model Smoothing – Volatility Analysis 1

- Compares year on year volatility reduction of each model type (smoothed with different weightings)

- <u>AIM:</u> To assess differences in between each year:

  - Compare **12/13** applied smoothed model (10/11, 11/12, 12/13) (34:33:33)
    To
  - Applied smoothed model for **11/12** (09/10, 10/11, 11/12) (34:33:33)

  - Compare **12/13** proposed model (10/11, 11/12, 12/13) with revised weightings (50:30:20)
    To
  - Applied smoothed model for **11/12** (09/10, 10/11, 11/12) with current weightings (34:33:33)

- The above gives an indication of the volatility if switching from one approach to another in first year of new approach

- Using variations in CWV intercepts and RMS values to identify level of volatility between model types and years for Small NDM EUCs.
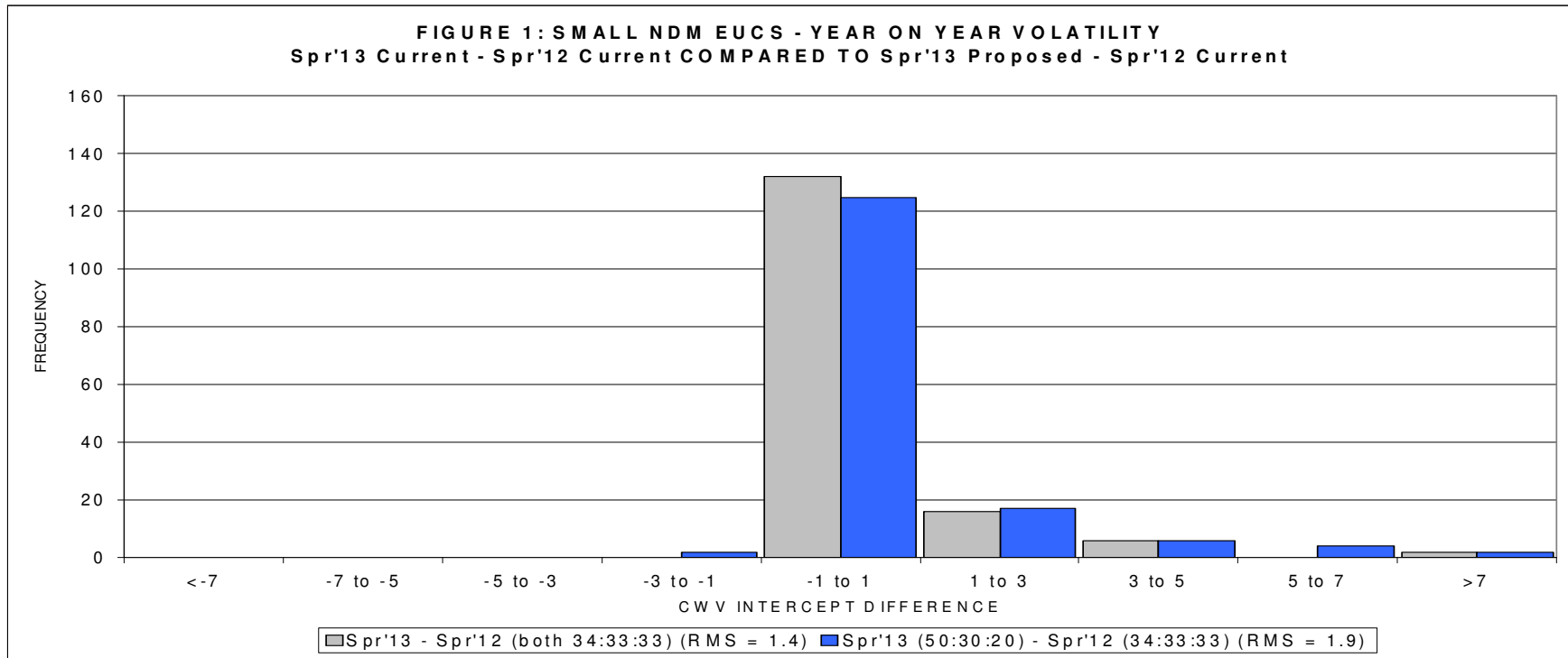

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Model Smoothing - Volatility Analysis 1

FIGURE 1: SMALL NDM EUCS - YEAR ON YEAR VOLATILITY
Spr'13 Current - Spr'12 Current COMPARED TO Spr'13 Proposed - Spr'12 Current

Legend: Spr'13 - Spr'12 (both 34:33:33) (RMS = 1.4)   Spr'13 (50:30:20) - Spr'12 (34:33:33) (RMS = 1.9)

- 156 Small NDM EUCs assessed
- Current Model has smaller CWV Intercept differences and lower RMS values and so overall less volatility

FIGURE 2: SMALL NDM CONSUMPTION BANDS - YEAR ON YEAR VOLATILITY
Spr'13 Current - Spr'12 Current COMPARED TO Spr'13 Proposed - Spr'12 Current

Legend:
- Spr'13 - Spr'12 (both 34:33:33) (RMS = 0.2)
- Spr'13 (50:30:20) - Spr'12 (34:33:33) (RMS = 0.3)

- 52 Small NDM EUCs assessed
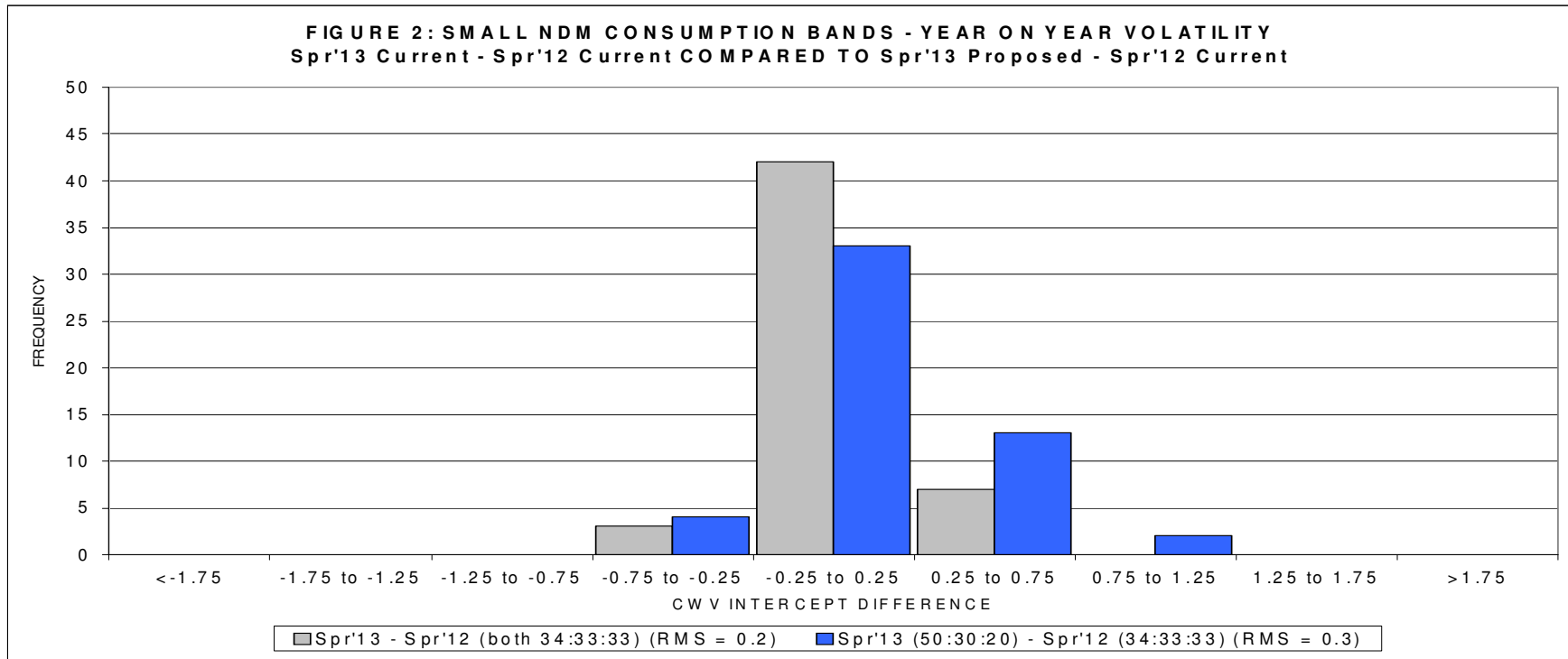- Current Model has smaller CWV Intercept differences and lower RMS values and so overall less volatility

Model Smoothing – Volatility Analysis 2

- Spring 2012

Analysis Period	Current Model Smoothing Approach		Tested Model Smoothing Approach	
	Spring 2012	Spring 2013	Spring 2012	Spring 2013
09/10	33%		20%	
10/11	33%	33%	30%	20%
11/12	34%	33%	50%	30%
12/13		34%		50%

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Model Smoothing – Volatility Analysis 2

- Compares year on year volatility reduction of each model type (smoothed with different weightings)

- <u>AIM:</u> To assess differences in between each year:

  - Compare **12/13** applied smoothed model (10/11, 11/12, 12/13) (34:33:33)
    To
  - Applied smoothed model for **11/12** (09/10, 10/11, 11/12) (34:33:33)

  - Compare **12/13** proposed model (10/11, 11/12, 12/13) with revised weightings (50:30:20)
    To
  - Proposed smoothed model for **11/12** (09/10, 10/11, 11/12) with revised weightings (50:30:20)

- The above gives an indication of the volatility where both are on the same basis

- Using variations in CWV intercepts and RMS values to identify level of volatility between model types and years.
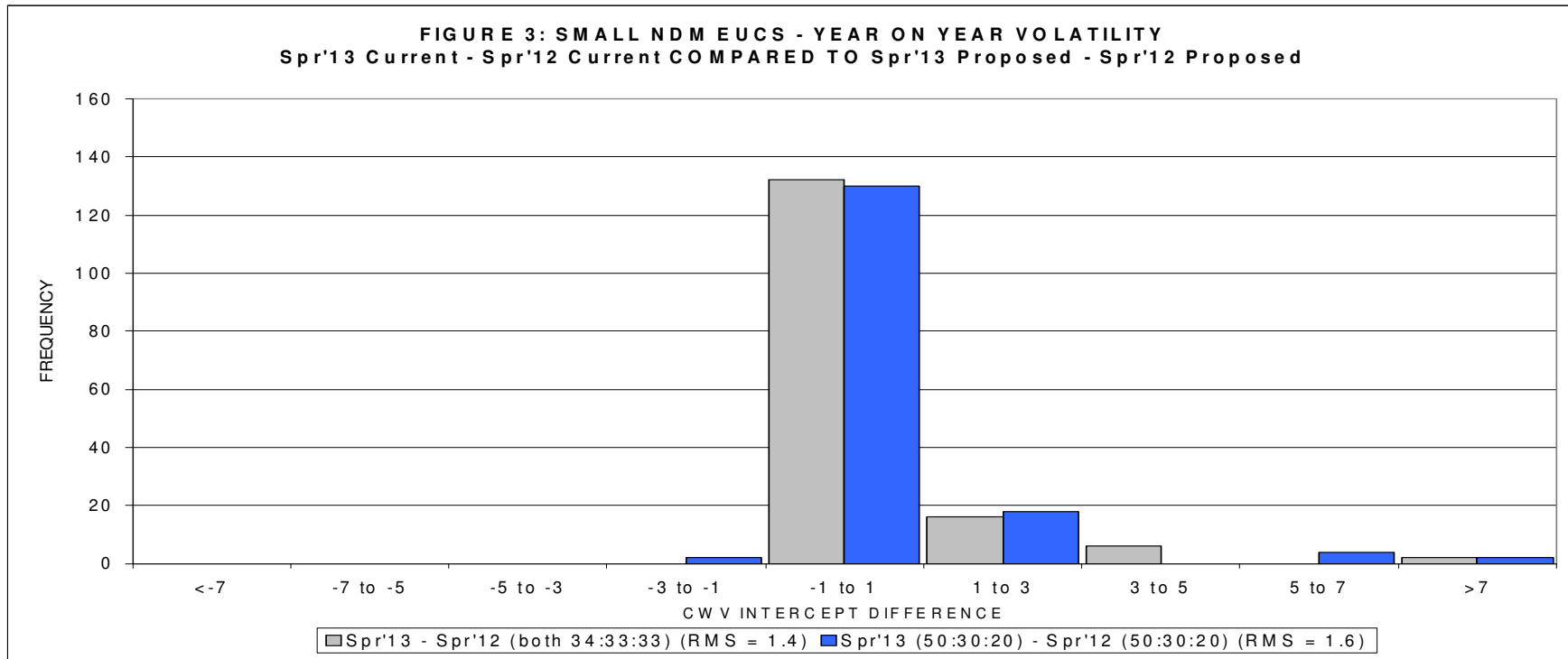
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Model Smoothing – Volatility Analysis 2

** Slide Updated **

FIGURE 3: SMALL NDM EUCS - YEAR ON YEAR VOLATILITY
Spr'13 Current - Spr'12 Current COMPARED TO Spr'13 Proposed - Spr'12 Proposed

Legend: Spr'13 - Spr'12 (both 34:33:33) (RMS = 1.4) | Spr'13 (50:30:20) - Spr'12 (50:30:20) (RMS = 1.6)

- 156 Small NDM EUCs assessed
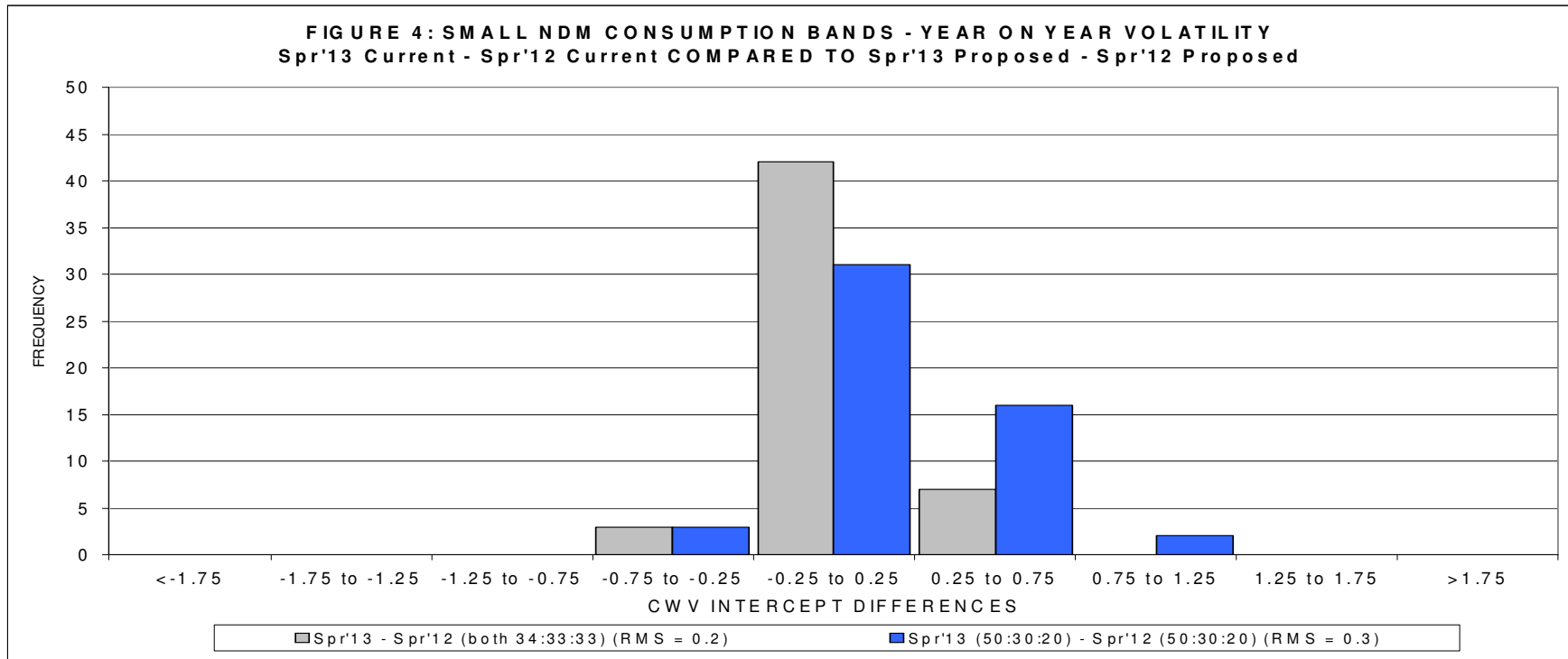- Current Model has smaller CWV Intercept differences and lower RMS values and so overall less volatility

Model Smoothing - Volatility Analysis 2

** Slide Updated **

FIGURE 4: SMALL NDM CONSUMPTION BANDS - YEAR ON YEAR VOLATILITY
Spr'13 Current - Spr'12 Current COMPARED TO Spr'13 Proposed - Spr'12 Proposed

Legend:
- Spr'13 - Spr'12 (both 34:33:33) (RMS = 0.2)
- Spr'13 (50:30:20) - Spr'12 (50:30:20) (RMS = 0.3)

X-axis (CWV INTERCEPT DIFFERENCES): <-1.75, -1.75 to -1.25, -1.25 to -0.75, -0.75 to -0.25, -0.25 to 0.25, 0.25 to 0.75, 0.75 to 1.25, 1.25 to 1.75, >1.75

Y-axis (FREQUENCY): 0 to 50

- 52 Small NDM EUCs assessed
- Current Model has smaller CWV Intercept differences and lower RMS values and so overall less volatility

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Model Smoothing – Predictability Analysis

- Compares variance of actual CWV intercept from most recent data set (i.e. 2012/13) to the different smoothed models

- <u>AIM:</u> To assess differences in CWV intercepts between each year:

    - Compare **12/13** smoothed model (with current weightings 34:33:33)
    To
    - Most recent data set for **12/13**

    - Compare **12/13** smoothed model (with revised weightings 50:30:20)
    To
    - Most recent data set for **12/13**

- Using variations in CWV intercepts and RMS values to identify level of predictability
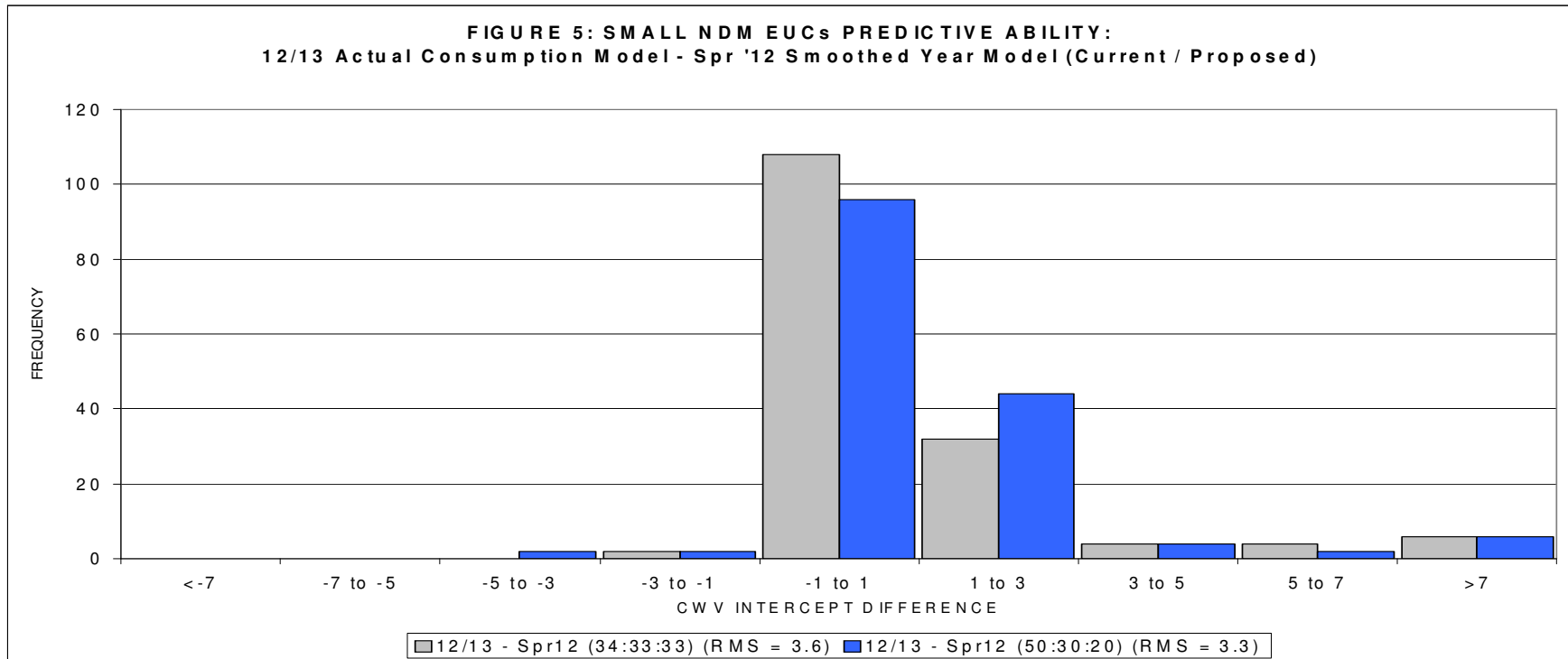
Model Smoothing – Predictability Analysis 1

** Slide Updated **

FIGURE 5: SMALL NDM EUCs PREDICTIVE ABILITY:
12/13 Actual Consumption Model - Spr '12 Smoothed Year Model (Current / Proposed)

Legend: 12/13 - Spr12 (34:33:33) (RMS = 3.6)   12/13 - Spr12 (50:30:20) (RMS = 3.3)

- 156 Small NDM EUCs assessed
- Proposed Model has smaller CWV Intercept differences and lower RMS values and so overall less volatility

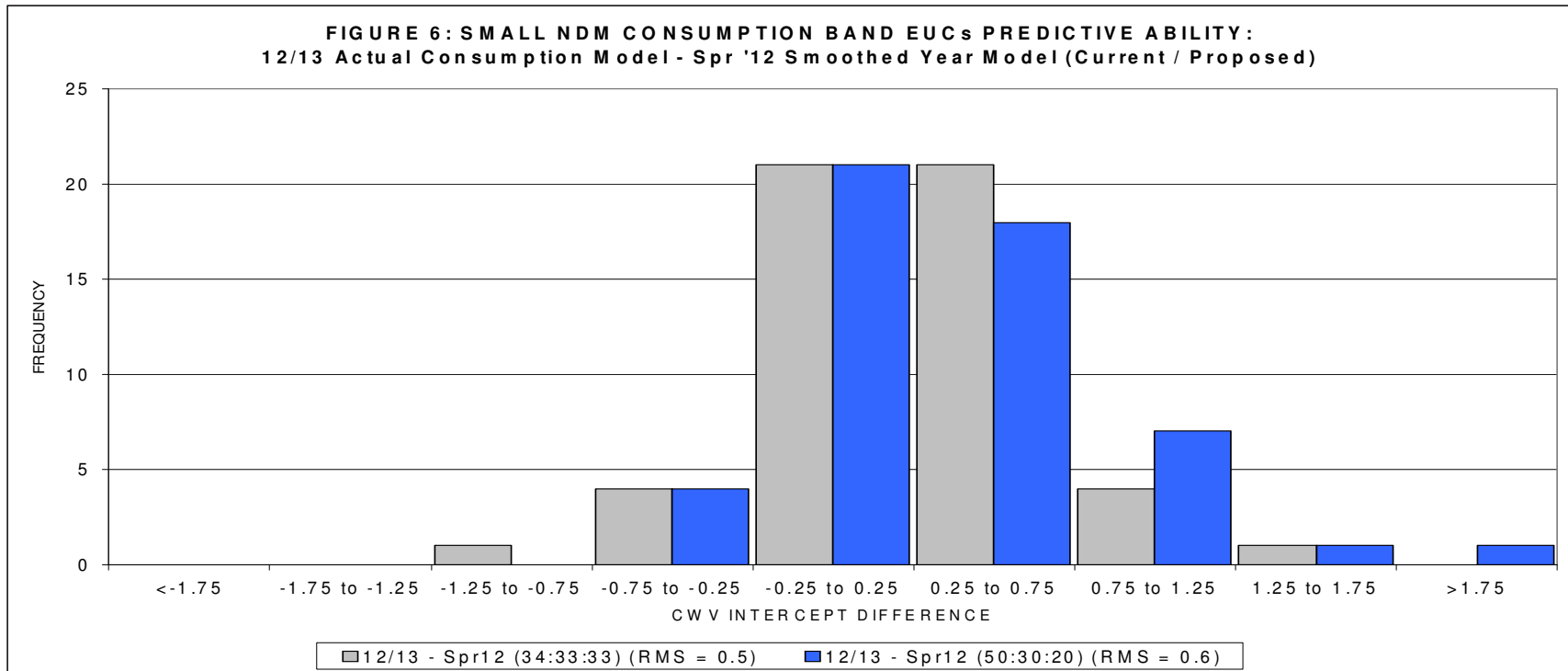# Model Smoothing – Predictability Analysis 1

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FIGURE 6: SMALL NDM CONSUMPTION BAND EUCs PREDICTIVE ABILITY:
12/13 Actual Consumption Model - Spr '12 Smoothed Year Model (Current / Proposed)

Legend: 12/13 - Spr12 (34:33:33) (RMS = 0.5)   12/13 - Spr12 (50:30:20) (RMS = 0.6)

- 52 Small NDM EUCs assessed
- Current Model has smaller CWV Intercept differences and lower RMS values and so overall less volatility

Model Smoothing – Overall Conclusion

- Volatility: There is insufficient evidence to suggest that a reduction in volatility will be seen by changing the weightings from 34:33:33 to 50:30:20

- Predictability: There is a slight improvement across all EUCs using the revised weightings (although not observed for the consumption bands)

- Results seem to support TWG's initial thoughts that the weightings should remain 'as-is'

- TWG will be asked to provide final recommendation to DESC at TWG meeting on 15th January 2014

- Further review of Model Smoothing appropriateness to be carried out in Autumn 2014

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