



**TÜRKİYE CUMHURİYET
MERKEZ BANKASI**

Turkish Survey of Expectations: Methodological Changes, Sample Fixing and Use in Policy

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OUTLINE

- Why and How of '*Measuring uncertainty*'
 - Proxies such as variance (disagreement), expectation errors etc.
 - Some literature review

- Measuring individual uncertainty examples
 - U.S. And E.U. examples
 - Volatile and high inflation environment needs a better solution

- First results (this is a preliminary work!)

- Sample fixing, results

- Use in policy









Why and How of '*Measuring uncertainty*'

- Uncertainty adversely affects agents' decision-making process
 - Reducing investment by 'wait-and-see' strategies
 - Growing literature started by Bloom (2009)

- A latent variable, several observed variables are used as proxies
 - Economics:
 - Past variance of macro variables (ARCH) -> not forward-looking
 - Finance:
 - VIX implied volatility of S&P 500 index options
 - Surveys:
 - Variance of answers (disagreement)
 - Q3-Q1 of point forecasts
 - Forecast errors

 - Density forecasts

Some literature review

- Zarnowitz and Lambros (1987)
 - US-SPF 
- Bomberger (1996)
 - US-SPF 
- Boero, Smith and Wallis (2008) (2010)
 - UK-SEF  
- Rich and Tracy (2010)
 - US-SPF 
- Rich, Song and Tracy (2012)
 - ECB survey 
- Lahiri and Sheng (2010)
 - US-SPF  

Total Uncertainty is the sum of Disagreement and Individual Uncertainty

$$\text{Disagreement} = \sum_i (P_{it} - \bar{P}_t)^2 / N$$

$$\text{Average Individual Uncertainty} = \sum_i \sigma_{it}^2 / N$$

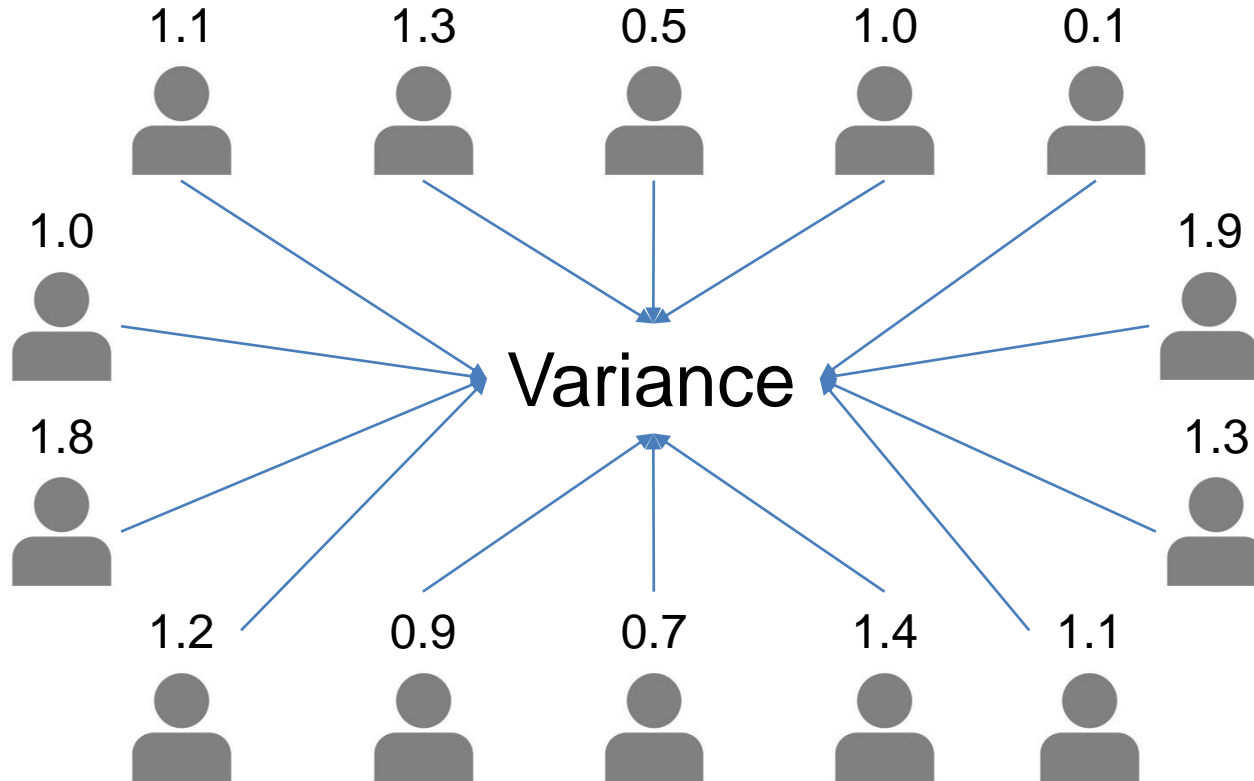
Total Uncertainty = Disagreement + Avg. Ind. Unc.

Wallis decomposition (2004, 2005)

Disagreement vs. Individual Uncertainty

Your inflation expectations?

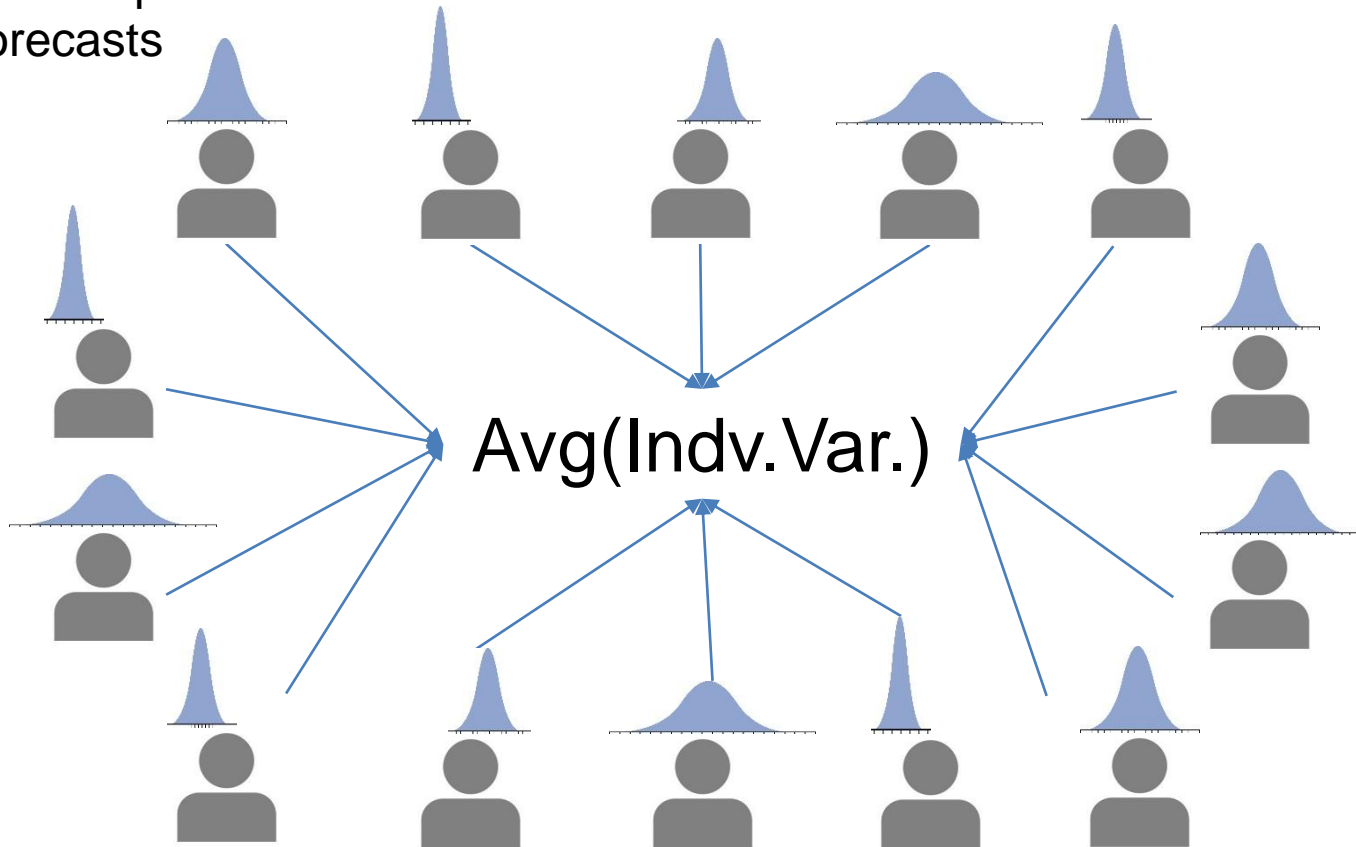
Point forecasts



$$\text{Disagreement} = \sum_i (P_{it} - \bar{P}_t)^2 / N$$

Disagreement vs. Individual Uncertainty

Your inflation expectations?
Density forecasts



$$\text{Average Individual Uncertainty} = \sum_i \sigma_{it}^2 / N$$

Examples of Measuring Individual Uncertainty (Density Forecasts)

U.S.: Philly Fed

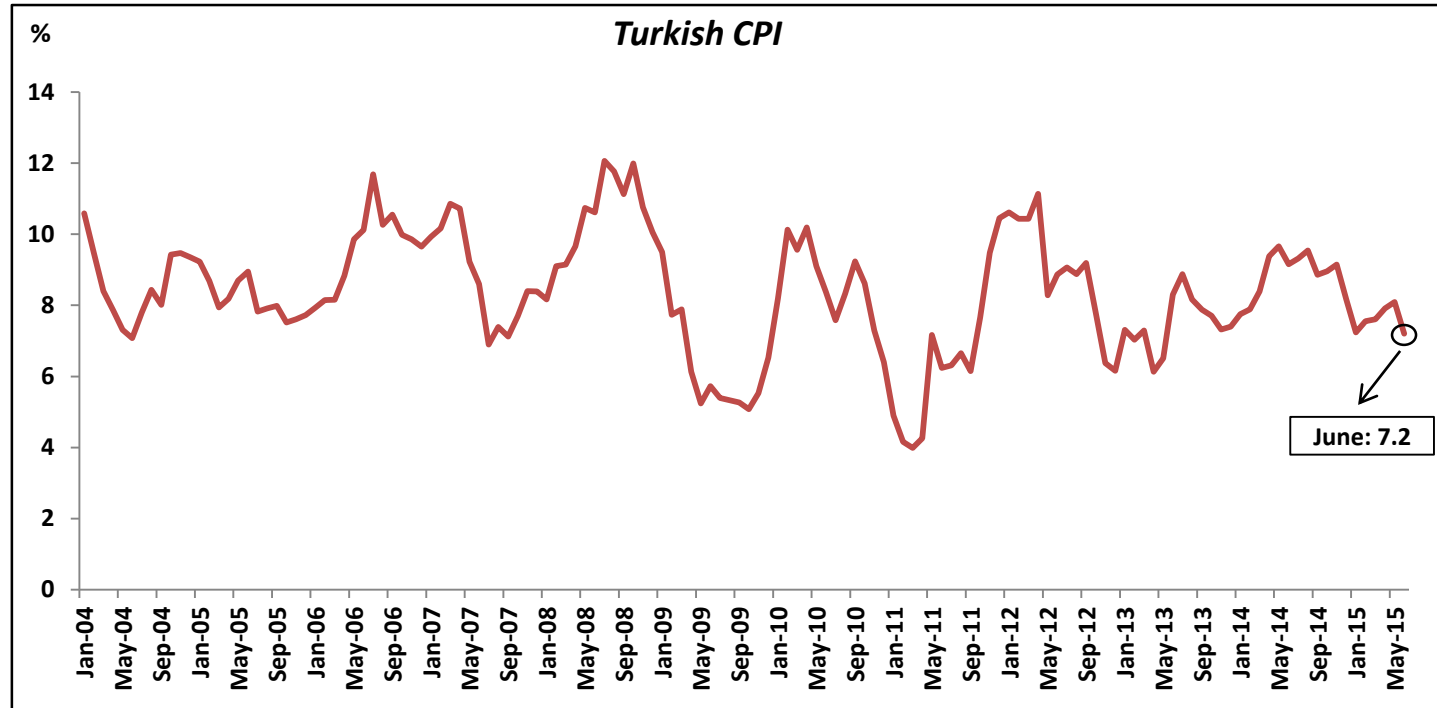
	Ranges (Fourth-Quarter over Fourth-Quarter Percent Changes)	
	PRCCPI	PRCPCE
1	4.0 or more	4.0 or more
2	3.5 to 3.9	3.5 to 3.9
3	3.0 to 3.4	3.0 to 3.4
4	2.5 to 2.9	2.5 to 2.9
5	2.0 to 2.4	2.0 to 2.4
6	1.5 to 1.9	1.5 to 1.9
7	1.0 to 1.4	1.0 to 1.4
8	0.5 to 0.9	0.5 to 0.9
9	0.0 to 0.4	0.0 to 0.4
10	Will decline	Will decline

E.U.: ECB

	Probabilities of euro area inflation* Year-on-year change in the HICP					
	2013	2014	2015	December 2013	December 2014	5 years ahead (2017)
< -1.0%						
-1.0- -0.6%						
-0.5- -0.1%						
0.0-0.4%						
0.5-0.9%						
1.0-1.4%						
1.5-1.9%						
2.0-2.4%						
2.5-2.9%						
3.0-3.4%						
3.5-3.9%						
≥ 4.0%						
Total	100	100	100	100	100	100

Fixed intervals!

Density Forecasts in Volatile Inflation Environment



Density Forecasts in Turkish SoE

Annual Inflation

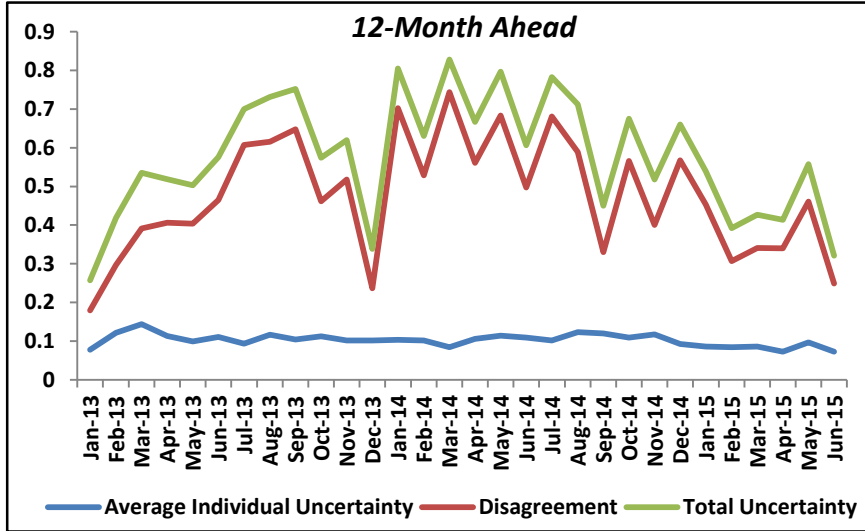
End of the Next 12 Months
(November 2014 - October 2015)

Starting from the bottom, please fill 10 boxes below, which will draw a probabilistic distribution about your expectation of CPI annual inflation at the end of the next 12 months.

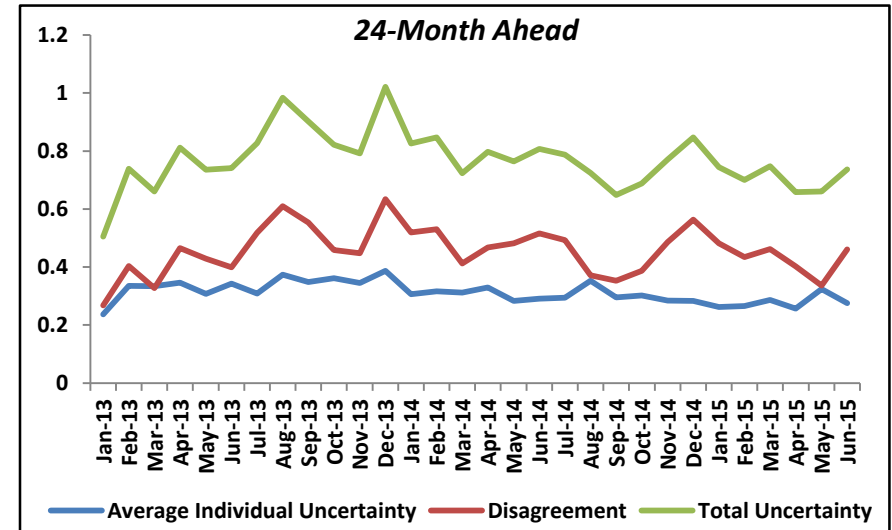
smaller - 3.75	3.76 - 4.25	4.26 - 4.75	4.76 - 5.25	5.26 - 5.75	5.76 - 6.25	6.26 - greater
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Disagreement is driving total uncertainty in Turkey

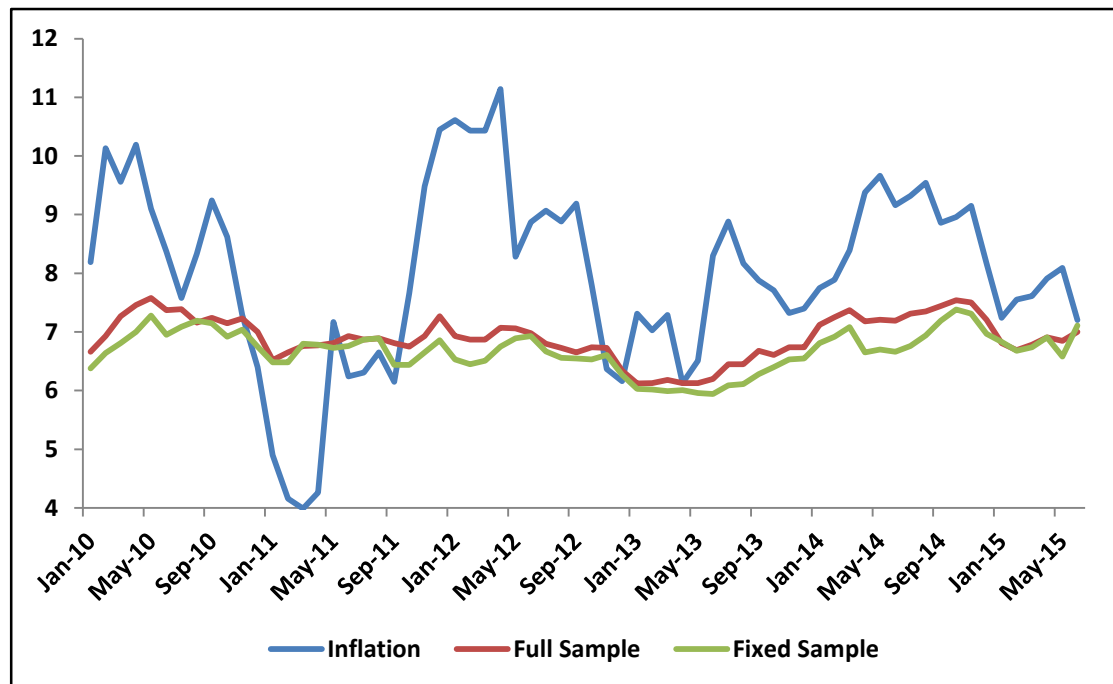


No correlation between average individual uncertainty and disagreement



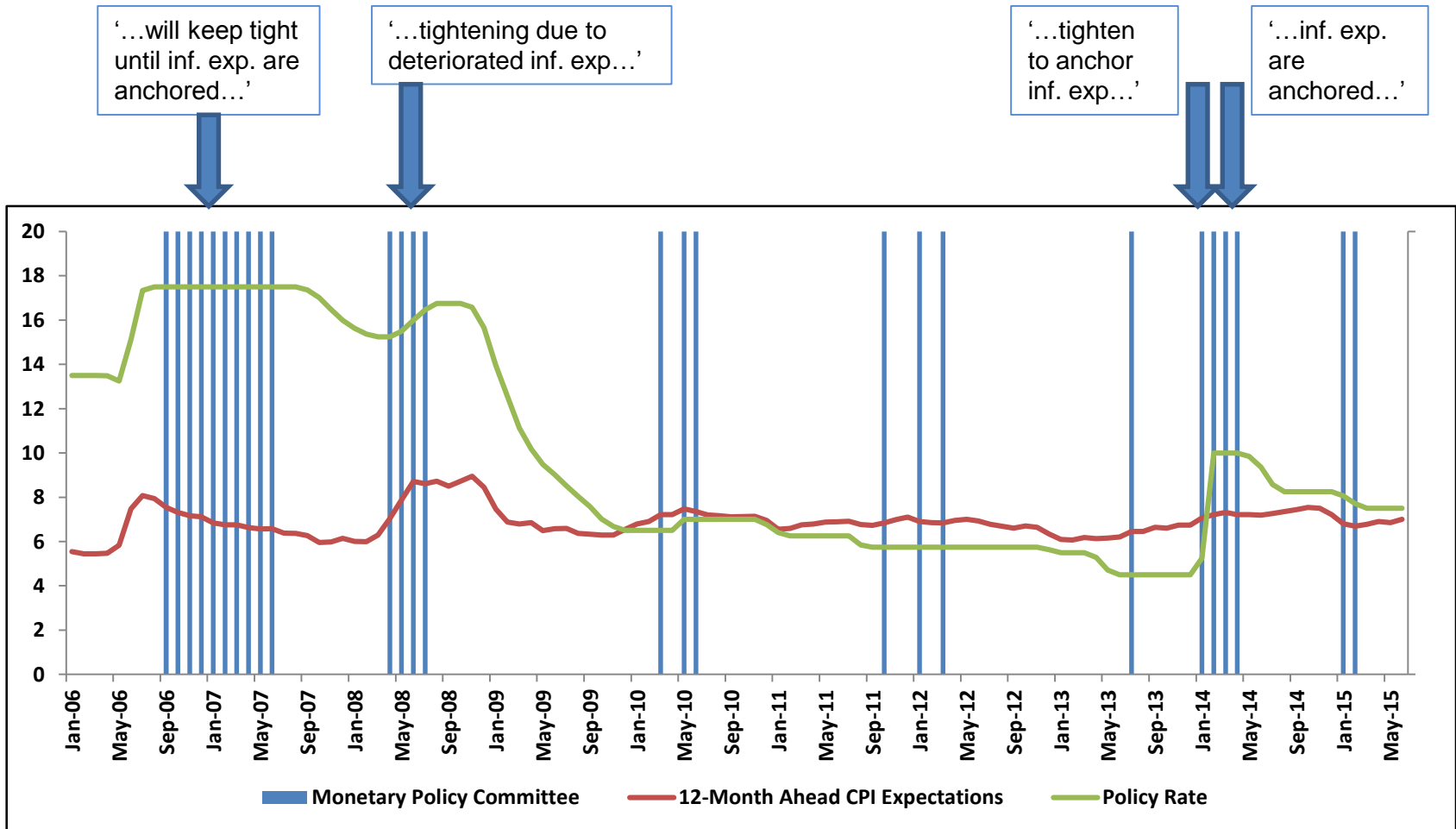
Sample Fixing

- A subsample of participants including:
 - Well-known
 - Well-performed (in expectations) professionals



No Clear Improvement!

Use in Policy





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THANK YOU

STATISTICS DEPARTMENT