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Does the central banker type affect inflation expectations?

Helder Ferreira de Mendonça
Fluminense Federal University and CNPq

Pedro Mendes Garcia
Institute for Applied Economic Research

Abstract

Based on the Brazilian data, this paper shows empirical evidence regarding the effect of central banker type (weak or strong) on the content of survey-based and market-based inflation expectations for explaining realized inflation. The findings indicate that the content of survey-based and market-based inflation expectations explaining the realized inflation is sensitive to the central banker type.

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Contact: Helder Ferreira de Mendonça - helderfm@hotmail.com, Pedro Mendes Garcia - pedromendes127@gmail.com.
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1. Introduction

It is a fact that under inflation targeting, the primary tool for managing monetary policy is the interest rate, and one of the leading information used by the central bank to set it is the inflation expectations. Although survey-based and market-based inflation expectations are generally correlated, they can represent different informational content and thus can reveal different levels of central bank success regarding anchoring expectations to the target. In general, inflation expectations from surveys have the advantages of being publicly available, and no hypothesis or model is needed, but they are subjected to strategic misreporting from respondents (Canova and Gambetti, 2010; and Armantier et al., 2013). Market-based inflation expectations are relevant because they are available daily, focus on beliefs of financial markets, and uses decisions that matter financially (Söderlind, 2011). However, the risk of inflation and liquidity premia can affect the extraction of implicit inflation expectations.

We investigate if weak and strong central bankers, the situation when the central bank is not committed to the target, and when it is committed to the target, respectively, affect the difference of content between the survey-based and market-based inflation expectations. Based on the Brazilian data from September of 2005 to March of 2018, we consider different institutional environments regarding the central bank's ability to anchor inflation expectations to the target (weak and strong central banker's period). The findings indicate that the central bank's performance regarding anchoring inflation expectations to the target is associated with different content from survey-based and market-based inflation expectations.

2. Extracting survey-based and market-based inflation expectations

Survey-based inflation expectations are daily informed from up 140 institutions and are available at the Time Series Management System of the Central Bank of Brazil (CBB). Based on this information, we built three measures of inflation expectations. The first measure ($SURVEY1_{t+12}$) uses stated inflation expectations by the survey participants (mean and median) for the next twelve months. The second measure considers the end-of-month forecasts ($SURVEY2_{t+\tau}$). Because this information is not mandatory for the survey participants, the sample of forecasters can be different from the previous one. Furthermore, end-of-month forecasts are available for up to eighteen months ahead, and thus, we can accumulate end-of-month forecasts in the last twelve months for twelve and eighteen months ahead, that is:

(1) $SURVEY2_{t,t+\tau} = \{\prod_{t+\tau-12}^{t+\tau}[1 + E_t(INF_{t+\tau}^m)]\} - 1,$

where: $E_t(INF_{t+\tau}^m)$ is the monthly mean of daily inflation expectations (or reference date) at month t (m) for the end-of-month inflation rate $t+\tau$ months ahead ($INF_{t+\tau}^m$, τ=12 and 18).

Third measure ($SURVEY3_{t+k}$) extends the expectations to up to 24 months ahead interpolating the average (or median) of end-of-year forecasts (see Montes et al., 2016), that is:

(2) $SURVEY3_{t,t+k} = \frac{[12-(m-1)]\times E_t(INF_{t+k}^y)+(m-1)\times E_t(INF_{t+k+1}^y)}{12},$

where: $E_t(INF_{t+k}^y)$ is the monthly mean of daily inflation expectations (or reference date) at month t (m) for the end-of-year inflation rate $t+k$ years ahead (INF_{t+k}^y, k=1 year = 12 months, and 2 years = 24 months). *SURVEY3* for t+18 months ahead is a result of:

(3) $SURVEY3_{t,t+18} = \begin{cases} \frac{[12-(6+m-1)]\times E_t(INF_{t+12}^y)+(6+m-1)\times E_t(INF_{t+24}^y)}{12}, m < 7 \\ \frac{[12-(m-6-1)]\times E_t(INF_{t+24}^y)+(m-6-1)\times E_t(INF_{t+36}^y)}{12}, m \geq 7 \end{cases}.$

In order to improve the predictive ability of the survey's participants, CBB publishes a Top 5 ranking based on projections for the short-, medium-, long-term forecasts. The ranking uses information from the "reference date" (last business day before the release of the inflation

preview - IPCA-15). Hence, besides the measures of inflation expectations based on all survey participants, we consider the measures from the Top 5.

Making use of the term structure of interest rates and the relationship between nominal and interest rates, we calculate the market-based inflation expectations. In Brazil, financial institutions trade inflation through government indexed bonds and IPCA (official inflation index) coupon contracts. Moreover, the Brazilian Financial and Capital Markets Association (ANBIMA) provides information that allows one to calculate the break-even inflation rate (see Svensson, 1994).

We extract market-based inflation expectations from the secondary market of government securities.[1] We estimate the nominal curve through National Treasury Bills (LTN) prices, and the real curve using inflation-indexed National Treasury Notes – B series (NTN-B). With spot curve parameter estimates, we build market-based inflation expectations for 12, 18, and 24 months ahead following Svensson's (1994) model. Thus, estimates of the spot curve of a $y^k_{t,t+\tau}$ rate from *t* to $t+\tau$ correspond to:

$$(4) \qquad y^k_{t,t+\tau} = \beta^k_{0t} + \beta^k_{1t}\left(\frac{1-e^{-\theta^k_t\tau}}{\theta^k_t\tau}\right) + \beta^k_{2t}\left(\frac{1-e^{-\theta^k_t\tau}}{\theta^k_t\tau} - e^{-\theta^k_t\tau}\right) + \beta^k_{3t},$$

where $\beta_0, \beta_1, \beta_2, \beta_3, \theta$ and $\tilde{\theta}$ are estimated minimizing of pricing errors.

The difference between the annualized nominal ($y^n_{t,t+\tau}$) and real ($y^n_{t,t+\tau}$) rates from equation (4) permit us to calculate the break-even inflation rate (*BIR*) from *t* to $t+\tau$, that is:

$$(5) \qquad BIR^s_{t,t+\tau} = y^n_{t,t+\tau} - y^r_{t,t+\tau}.$$

Therefore, market-based inflation expectations (accumulated in 12 months) in period *t* for the inflation at period $t+\tau$ is a result of:

$$(6) \qquad MARKET_{t,t+\tau} = e^{\left[BIR^s_{t,t+\tau}\times\left(\frac{\tau}{12}\right) - BIR^s_{t,t+\tau-12}\times\left(\frac{\tau-12}{12}\right)\right]} - 1.$$

Since the survey participants are the same players at the secondary market of government securities, a possible difference between survey-based and market-based inflation expectations must be due to a distinct informational content.

3. Empirical analysis

We implement Fair and Shiller's (1989) test estimating the following equation by OLS with HAC standard errors:

$$(7) \qquad INF_{t+\tau} = \gamma_0 + \gamma_1 MARKET_{t,t+\tau} + \gamma_2 SURVEY_{t,t+\tau} + \nu_t.$$

When only the parameter γ_1 (or γ_2) is significant, market-based (or survey-based) inflation expectations have additional content and all the relevant information to explain realized inflation contained in survey-based (or market-based) inflation expectations. By contrast, when γ_1 and γ_2 are both significant, a combination of the two informational contents is better to explain the realized inflation.

When a central banker is strong, market agents know that the monetary authority will stay committed to the inflation target. Agents have little incentive to try to influence monetary policy decisions, and thus it is probable that there is no significant difference between market-based and survey-based inflation expectations. Thus, we should expect that survey-based expectations' informational content will dominate the information in market-based expectations because they are not subjected to any asked premium from market agents.

During the period under analysis, the CBB had three governors: Henrique Meirelles (January 2003 to December 2010), Alexandre Tombini (January 2011 to June 2016), and Ilan Goldfajn (June 2016 to December 2018). Because there are not enough degrees of freedom to perform the models for all subsamples, the analysis focuses on Meirelles's period and

[1] The liquidity premium in the Brazilian inflation-indexed market is negligible (Vicente and Kubudi, 2018).

Tombini's period. In order to identify different environments regarding the ability of the CBB anchoring inflation expectations to the target, we use the credibility index developed by de Mendonça (2007). When inflation expectations are equal to the target, the case where the CBB has full success in anchoring expectations, the index is one. While inflation expectations depart from the target, the index is decreasing to zero. The index is zero when inflation expectations exceed the tolerance intervals. Analogously, when the index is close to one, the CBB has a "strong" behavior, and when it is close to zero, it has a "weak" behavior. Table 1 presents the performance of the CBB's ability to anchor inflation expectations.[2]

Table 1

CBB's performance to anchor inflation expectations

	Mean of forecasts		*Median of forecasts*		*Mean of forecasts on reference date*		*Median of forecasts on reference date*	
12 months ahead:	*Meirelles*	*Tombini*	*Meirelles*	*Tombini*	*Meirelles*	*Tombini*	*Meirelles*	*Tombini*
EFFECTIVE	0.62	0.11	n/a	n/a	0.61	0.11	n/a	n/a
Full sample:								
STATED1	0.78	0.30	0.79	0.31	0.77	0.30	0.78	0.31
STATED2	0.78	0.31	0.79	0.31	0.78	0.31	0.78	0.31
STATED3	0.66	0.23	0.66	0.23	0.65	0.22	0.65	0.23
Top 5:								
STATED2	0.79	0.20	0.79	0.21	0.78	0.20	0.79	0.21
STATED3	0.65	0.17	0.66	0.18	0.64	0.17	0.65	0.18
18 months ahead:								
EFFECTIVE	0.62	0.09	n/a	n/a	0.61	0.10	n/a	n/a
Full sample:								
STATED2	0.84	0.40	0.85	0.41	0.82	0.39	0.83	0.40
STATED3	0.87	0.37	0.87	0.38	0.86	0.36	0.87	0.37
Top 5:								
STATED2	0.91	0.33	0.91	0.34	0.91	0.32	0.90	0.33
STATED3	0.86	0.27	0.87	0.27	0.86	0.26	0.87	0.27
24 months ahead:								
EFFECTIVE	0.55	0.13	n/a	n/a	0.54	0.13	n/a	n/a
Full sample:								
STATED3	0.86	0.39	0.87	0.40	0.86	0.39	0.87	0.40
Top 5:								
STATED3	0.85	0.28	0.86	0.29	0.85	0.28	0.86	0.29

Note: CBB's performance to anchor inflation expectations according to de Mendonça's (2017) credibility index. Values close to one indicate a "strong" CBB's behavior, and values close to zero indicate a "weak" CBB's behavior.

There is an evident difference between Meirelles and Tombini's periods. In general, the ability of the CBB to anchor inflation expectations to the target in Meirelles's period is higher than twice of that in Tombini's period. Hence, we can assume Meirelles as a strong central banker and Tombini as a weak central banker. The general average for the survey-based inflation expectations in Meirelles's period corresponds to 0.8. Except for *SURVEY3*, the mean credibility for the Meirelles's period is higher than 0.75 for twelve months ahead, and it gets close to 0.9 for eighteen and twenty-four months ahead. The average credibility in Tombini's period is only 0.3. The results from market-based inflation expectations also point out the

[2] Tables A.1. and A.2 (appendix) show the descriptive statistics regarding expectations for both Meirelles and Tombini's period.

considerable difference between the performances regarding the ability of the CBB anchoring expectations to the target. While Meirelles's period has a general average (considering all horizons) of 0.6, the Tombini's period corresponds to 0.11.

We perform Fair and Shiller's (1989) test based on two subsamples: Meirelles and Tombini's mandates as governor of CBB (see tables 2 and 3). The comparison of the results between Meirelles and Tombini's period reveals a clear difference regarding the useful content in market-based and survey-based inflation expectations for explaining realized inflation.

The findings for the Meirelles's period related to twelve months ahead, for both all survey participants and Top 5, indicate that market-based inflation expectations are significant in all models, while survey-based inflation expectations are significant in almost half of them. This result suggests that a combination of information on both expectations is useful to explain the realized inflation. The results from the Tombini's period is opposite to this. Coefficients on both market-based and survey-based inflation expectations are not significant in any model. This evidence is in line with the assumption that a weak central banker wrecks the use of expectations as a tool to explain the inflation in the short-term.

The analysis from the eighteen and twelve-four months ahead brings us differences in comparison to the short-term. Although the combination of information from survey-based and market-based inflation expectations are less relevant in medium-term to explain the realized inflation in Meirelles's period, the survey-based inflation expectations gain relevance. The highlight is the case of *SURVEY2* with statistical significance in all models. This result is emblematic because it suggests that the presence of a strong central banker can decrease the difference of content between the stated inflation expectations in surveys and those practiced in the market. The results from Tombini's period is also impressive. Based on the models which consider all survey participants, the coefficients on both market-based and survey-based inflation expectations are significant in all models. Hence, in the case of a weak central banker, a combination of market-based and survey-based inflation expectations is useful for explaining the realized inflation (medium-term).

Table 2

The difference in the informational content of stated and effective expectations (12, 18, and 24 months ahead) – Meirelles's period

	Mean of forecasts			***Median of forecasts***			***Mean of forecasts on ref. date***			***Median of forecasts on ref. date***		
All survey participants:	***t+12***	***t+12***	***t+12***	***t+12***	***t+12***	***t+12***	***t+12***	***t+12***	***t+12***	***t+12***	***t+12***	***t+12***
EFFECTIVE	1.302***	1.280***	0.861**	1.383***	1.161***	0.861**	1.124***	1.159***	0.795**	1.233**	1.039***	0.792**
	(0.421)	(0.403)	(0.338)	(0.426)	(0.386)	(0.337)	(0.391)	(0.401)	(0.318)	(0.398)	(0.394)	(0.317)
STATED1	-1.382			-1.576**			-1.096			-1.317**		
	(0.657)			(0.638)			(0.674)			(0.643)		
STATED2		-1.394**			-1.203*			-1.162*			-0.962	
		(0.664)			(0.666)			(0.682)			(0.706)	
STATED3			-0.445			-0.446			-0.381			-0.376
			(0.340)			(0.339)			(0.333)			(0.333)
Top 5:												
EFFECTIVE		1.405***	0.930***		1.430***	0.951***		1.382***	0.853***		1.375***	0.885***
		(0.405)	(0.323)		(0.402)	(0.322)		(0.402)	(0.303)		(0.390)	(0.302)
STATED2		-1.642***			-1.701***			-1.606***			-1.593***	
		(0.577)			(0.576)			(0.592)			(0.590)	
STATED3			-0.527*			-0.553			-0.451			-0.485
			(0.322)			(0.326)			(0.308)			(0.308)
All survey participants:	***t+18***	***t+18***	***t+24***	***t+18***	***t+18***	***t+24***	***t+18***	***t+18***	***t+24***	***t+18***	***t+18***	***t+24***
EFFECTIVE	4.581***	0.490	0.286	3.575***	0.627	0.298	3.000**	0.462	0.245	2.799***	0.584	0.262
	(0.490)	(0.458)	(0.383)	(0.316)	(0.453)	(0.385)	(1.144)	(0.393)	(0.331)	(0.699)	(0.399)	(0.334)
STATED2	-10.990***			-8.873***			-8.008***			-8.587***		
	(1.080)			(0.661)			(1.466)			(1.408)		
STATED3		-1.165	-0.717		-1.645	-0.750		-1.099	-0.693		-1.517*	-0.734
		(0.882)	(0.795)		(0.884)	(0.812)		(0.814)	(0.736)		(0.829)	(0.741)
Top 5:												
EFFECTIVE	2.799	0.269	-0.121	2.823*	0.627	-0.161	2.034	0.269	-0.058	-1.280**	0.280	-0.109
	(1.541)	(0.352)	(0.265)	(1.382)	(0.453)	(0.293)	(1.359)	(0.352)	(0.234)	(0.476)	(0.348)	(0.256)
STATED2	-1.604***			-1.805***			-1.137**			1.941		
	(0.272)			(0.162)			(0.466)			(1.248)		
STATED3		-0.494	0.494		-1.645	0.589		-0.494	0.346		-0.547	0.501
		(0.522)	(0.535)		(0.884)	(0.633)		(0.522)	(0.536)		(0.536)	(0.613)

Note: Test based on Fair and Shiller's (1989) – see equation (9). Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. Robust standard errors (Newey-West) are in parentheses.

Table 3

The difference in the informational content of stated and effective expectations (12, 18, and 24 months ahead) – Tombini's period

	Mean of forecasts			***Median of forecasts***			***Mean of forecasts on ref. date***			***Median of forecasts on ref. date***		
All survey participants:	***t+12***	***t+12***	***t+12***	***t+12***	***t+12***	***t+12***	***t+12***	***t+12***	***t+12***	***t+12***	***t+12***	***t+12***
EFFECTIVE	0.071	0.057	0.529	0.139	-0.035	0.523	-0.104	-0.109	0.508	-0.047	-0.175	0.499
	(0.390)	(0.385)	(0.466)	(0.391)	(0.361)	(0.467)	(0.385)	(0.390)	(0.445)	(0.379)	(0.370)	(0.446)
STATED1	1.593			1.390			1.991*			1.803		
	(1.326)			(1.312)			(1.192)			(1.158)		
STATED2		1.688			1.993*			2.005			2.202**	
		(1.336)			(1.185)			(1.211)			(1.041)	
STATED3			0.185			0.192			0.198			0.208
			(0.350)			(0.349)			(0.399)			(0.336)
Top 5:												
EFFECTIVE		1.075***	0.668		1.109***	0.659		0.978***	0.636		0.943***	0.630
		(0.328)	(0.464)		(0.340)	(0.460)		(0.288)	(0.448)		(0.267)	(0.443)
STATED2		-1.302			-1.391			-0.950			-0.827	
		(1.134)			(1.208)			(1.005)			(1.022)	
STATED3			-0.002			0.010			0.024			0.032
			(0.415)			(0.400)			(0.401)			(0.389)
All survey participants:	***t+18***	***t+18***	***t+24***	***t+18***	***t+18***	***t+24***	***t+18***	***t+18***	***t+24***	***t+18***	***t+18***	***t+24***
EFFECTIVE	-0.539**	-0.580**	-1.348***	-0.560**	-0.572**	-1.336***	-0.502**	-0.533**	-1.231***	-0.522**	-0.523**	-1.201***
	(0.241)	(0.246)	(0.220)	(0.237)	(0.241)	(0.219)	(0.232)	(0.230)	(0.225)	(0.223)	(0.224)	(0.225)
STATED2	3.280**			3.655**			3.298**			3.588**		
	(1.636)			(1.500)			(1.643)			(1.519)		
STATED3		2.816**	1.945***		2.719**	1.807***		2.714***	1.895**		2.672**	1.753**
		(1.260)	(0.715)		(1.269)	(0.683)		(1.247)	(0.755)		(1.252)	(0.743)
Top 5:												
EFFECTIVE	-0.225	-0.412**	-1.330***	-0.210	-0.572**	-1.250***	-0.194	-0.388**	-1.284***	-0.182	-0.401**	-1.148***
	(0.150)	(0.186)	(0.244)	(0.144)	(0.241)	(0.236)	(0.139)	(0.184)	(0.250)	(0.132)	(0.189)	(0.232
STATED2	-1.418			-1.564*			-1.226			-1.343		
	(0.932)			(0.911)						(0.912)		
STATED3		1.079	1.331		2.719**	1.045		1.203	1.596**		1.408	1.161
		(1.746)	(0.817)		(1.269)	(0.802)		(1.621)	(0.756)		(1.603)	(0.757)

Note: Test based on Fair and Shiller's (1989) – see equation (9). Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. Robust standard errors (Newey-West) are in parentheses.

4. Conclusion

We tested if the central banker's type affects the informational content of survey-based and market-based inflation expectations for explaining the realized inflation. The findings indicate that, when the central bank is strong, the difference in the informational content is relevant in the short-term. On the other hand, when the central banker is weak, the difference is stronger in the medium-term.

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Table A.1

Descriptive statistics – Meirelles's period (September 2005 to December 2010)

	Mean of forecasts						*Median of forecasts*						*Mean of forecasts on critical date*						*Median of forecasts on critical date*					
	Mean	*Median*	*Max.*	*Min.*	*S.D.*	*Obs.*	*Mean*	*Median*	*Max.*	*Min.*	*S.D.*	*Obs.*	*Mean*	*Median*	*Max.*	*Min.*	*S.D.*	*Obs.*	*Mean*	*Median*	*Max.*	*Min.*	*S.D.*	*Obs.*
***Stated Expect.**: All participants*																								
$STATED1_{t+12}$	4.44	4.37	5.53	3.44	0.53	64	4.44	4.38	5.52	3.42	0.52	64	4.45	4.37	5.51	3.42	0.55	64	4.46	4.38	5.56	3.38	0.53	64
$STATED2_{t+12}$	4.44	4.34	5.44	3.44	0.52	64	4.45	4.39	5.44	3.48	0.51	64	4.45	4.37	5.52	3.42	0.54	64	4.47	4.39	5.57	3.45	0.54	64
$STATED2_{t+18}$	4.82	4.82	4.91	4.70	0.05	10	4.79	4.81	4.91	4.63	0.07	10	4.85	4.85	4.93	4.80	0.03	9	4.84	4.83	4.94	4.78	0.05	9
$STATED3_{t+12}$	4.64	4.45	6.49	2.98	0.87	64	4.65	4.46	6.50	2.98	0.87	64	4.65	4.44	6.56	2.96	0.89	64	4.66	4.45	6.58	2.97	0.89	64
$STATED3_{t+18}$	4.49	4.47	5.04	3.87	0.32	64	4.48	4.49	4.98	3.93	0.31	64	4.49	4.47	5.07	3.86	0.33	64	4.48	4.50	5.00	3.92	0.32	64
$STATED3_{t+24}$	4.49	4.48	5.31	3.89	0.34	64	4.48	4.50	5.26	3.99	0.34	64	4.50	4.49	5.35	3.89	0.35	64	4.49	4.50	5.33	3.99	0.34	64
***Stated Expect.:** Top 5*																								
$STATED2_{t+12}$	4.40	4.49	5.43	3.26	0.53	64	4.41	4.46	5.50	3.28	0.53	64	4.42	4.45	5.42	3.24	0.55	64	4.43	4.41	5.49	3.26	0.54	64
$STATED2_{t+18}$	4.68	4.66	4.91	4.52	0.12	10	4.68	4.63	4.94	4.55	0.13	10	4.68	4.67	4.88	4.52	0.11	9	4.70	4.67	4.95	4.55	0.14	9
$STATED3_{t+12}$	4.62	4.45	6.41	3.06	0.87	64	4.62	4.47	6.47	3.06	0.87	64	4.62	4.40	6.51	3.07	0.89	64	4.62	4.42	6.60	3.09	0.89	64
$STATED3_{t+18}$	4.43	4.47	5.03	3.83	0.32	64	4.43	4.48	4.97	3.81	0.32	64	4.44	4.48	5.01	3.82	0.33	64	4.43	4.48	4.94	3.81	0.33	64
$STATED3_{t+24}$	4.44	4.45	5.31	3.83	0.35	64	4.43	4.50	5.21	3.87	0.35	64	4.45	4.46	5.29	3.83	0.35	64	4.45	4.50	5.17	3.80	0.36	64
Effective Expect.																								
$EFFECTIVE_{t+12}$	5.09	4.89	6.92	3.55	0.81	64							5.10	4.92	6.96	3.50	0.84	64						
$EFFECTIVE_{t+18}$	5.08	5.01	6.64	3.34	0.78	64							5.12	5.07	7.34	3.29	0.84	64						
$EFFECTIVE_{t+24}$	5.30	5.30	6.40	3.57	0.68	64							5.34	5.29	7.61	3.47	0.76	64						

Table A.2

Descriptive statistics – Tombini's period (January 2011 to May 2016)

	Mean of forecasts						*Median of forecasts*						*Mean of forecasts on critical date*						*Median of forecasts on critical date*					
	Mean	*Median*	*Max.*	*Min.*	*S.D.*	*Obs.*	*Mean*	*Median*	*Max.*	*Min.*	*S.D.*	*Obs.*	*Mean*	*Median*	*Max.*	*Min.*	*S.D.*	*Obs.*	*Mean*	*Median*	*Max.*	*Min.*	*S.D.*	*Obs.*
Stated Expect.*: All participants*																								
$STATED1_{t+12}$	5.60	5.60	7.14	3.88	0.80	87	5.59	5.61	7.14	3.86	0.79	87	5.60	5.62	7.24	3.80	0.82	87	5.59	5.61	7.22	3.78	0.82	87
$STATED2_{t+12}$	5.59	5.58	7.04	3.88	0.77	87	5.58	5.55	6.96	3.90	0.76	87	5.60	5.59	7.24	3.79	0.81	87	5.60	5.60	7.15	3.80	0.81	87
$STATED2_{t+18}$	5.39	5.52	6.35	4.08	0.61	87	5.38	5.52	6.26	4.11	0.59	87	5.40	5.54	6.42	4.03	0.62	87	5.39	5.53	6.30	4.08	0.60	87
$STATED3_{t+12}$	6.08	5.99	10.58	2.88	1.60	87	6.08	6.00	10.61	2.86	1.60	87	6.09	6.03	10.66	2.81	1.63	87	6.09	6.02	10.68	2.78	1.63	87
$STATED3_{t+18}$	5.43	5.49	6.61	3.98	0.68	87	5.41	5.47	6.63	4.00	0.67	87	5.44	5.50	6.67	3.94	0.70	87	5.42	5.47	6.65	3.93	0.69	87
$STATED3_{t+24}$	5.38	5.51	6.79	4.02	0.66	87	5.37	5.50	6.81	3.99	0.65	87	5.39	5.52	6.85	3.99	0.67	87	5.37	5.50	6.87	3.96	0.67	87
Stated Expect.: *Top 5*																								
$STATED2_{t+12}$	5.78	5.95	7.65	3.77	0.85	87	5.75	5.95	7.58	3.63	0.88	87	5.79	5.93	8.07	3.68	0.90	87	5.76	5.92	7.98	3.52	0.92	87
$STATED2_{t+18}$	5.50	5.73	7.01	4.00	0.74	87	5.47	5.68	6.97	3.97	0.73	87	5.50	5.76	7.11	4.02	0.75	87	5.48	5.69	7.02	3.92	0.74	87
$STATED3_{t+12}$	6.16	6.26	10.50	2.83	1.60	87	6.16	6.24	10.56	2.80	1.60	87	6.17	6.27	10.60	2.76	1.64	87	6.17	6.25	10.67	2.75	1.64	87
$STATED3_{t+18}$	5.59	5.81	7.53	3.86	0.78	87	5.57	5.78	7.33	3.81	0.77	87	5.60	5.80	7.53	3.84	0.79	87	5.58	5.82	7.39	3.78	0.79	87
$STATED3_{t+24}$	5.57	5.73	7.13	4.05	0.74	87	5.54	5.67	6.87	4.00	0.74	87	5.57	5.71	7.18	4.02	0.76	87	5.54	5.67	7.00	3.90	0.76	87
Effective Expect.																								
$EFFECTIVE_{t+12}$	6.53	6.44	10.09	3.67	1.44	87							6.53	6.46	10.28	3.44	1.47	87						
$EFFECTIVE_{t+18}$	6.74	6.34	13.43	1.61	1.61	87							6.77	6.28	13.05	4.23	1.68	87						
$EFFECTIVE_{t+24}$	6.30	6.21	10.75	4.44	1.19	87							6.31	6.19	11.82	4.47	1.24	87						