monetary policy and currency returns: the foresight saga

10th fiw-research conference
"international economics"

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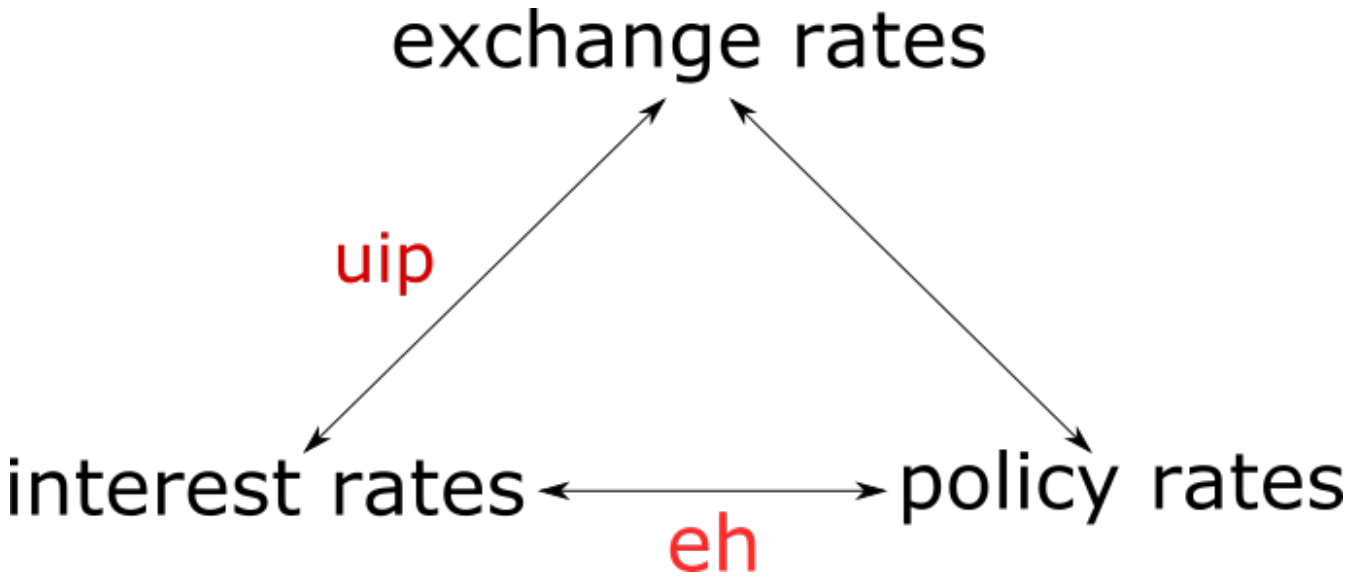
build-up

idea



build-up

previous research

- Mueller et al. (2017): higher vola and returns in the hours around announcements;
- Karnaukh (2016): dollar moves in the direction of upcoming policy rate changes.
- Lucca and Moench (2015): pre-fomc drift of stocks;
- ...

build-up

monetary policy via rate decisions

- USA: 8 per year
- UK: 8 per year
- Sweden: 6 per year
- ...

$\Rightarrow$ regular prescheduled meetings + announcements in most developed economies

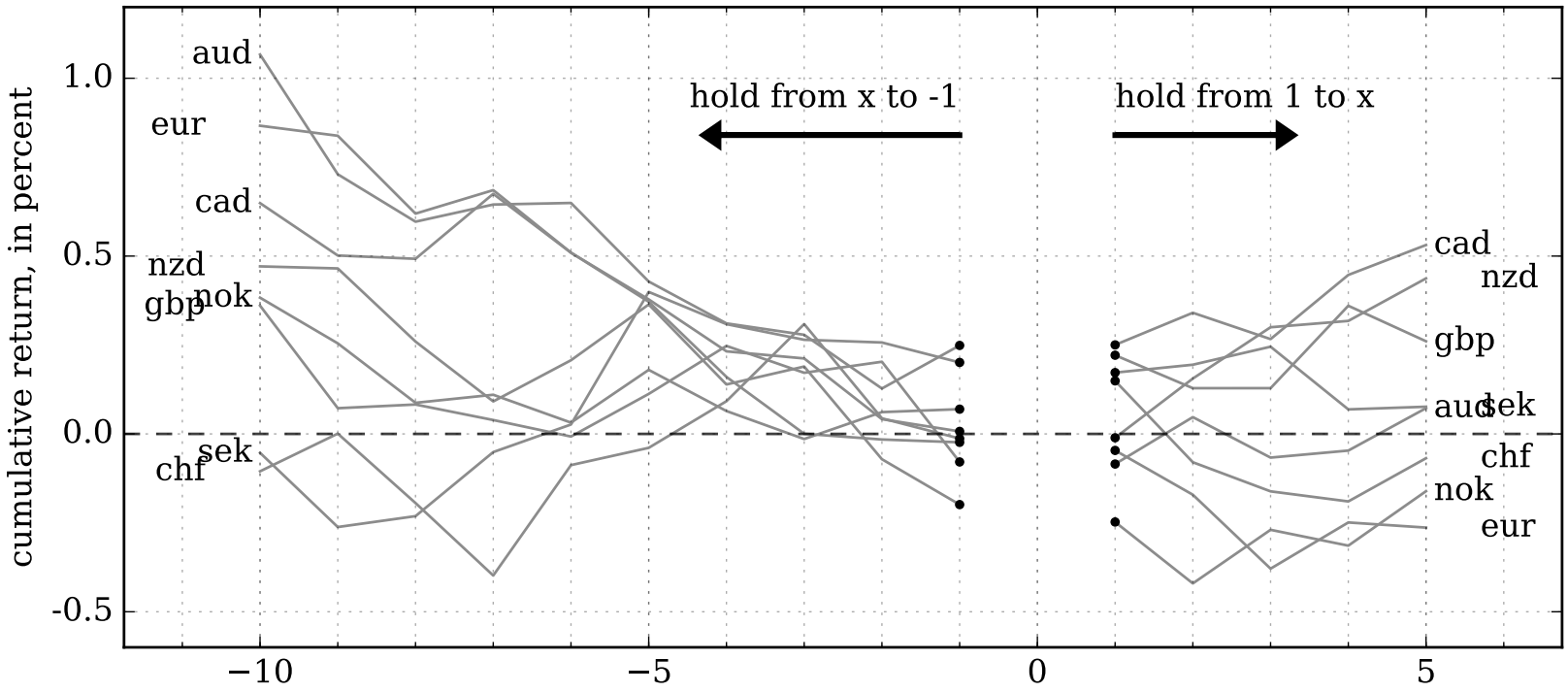
build-up

policy rate announcements

country	since	events	hikes	cuts
australia	1980s	180	19	24
canada	2000	131	18	25
eurozone	1999	202	11	20
new zealand	1999	130	23	22
norway	1999	128	21	23
sweden	1999	110	24	23
switzerland	2000	52	9	5
united kingdom	1998	196	10	20
united states	1994	132	20	18
total events		1254	155	180

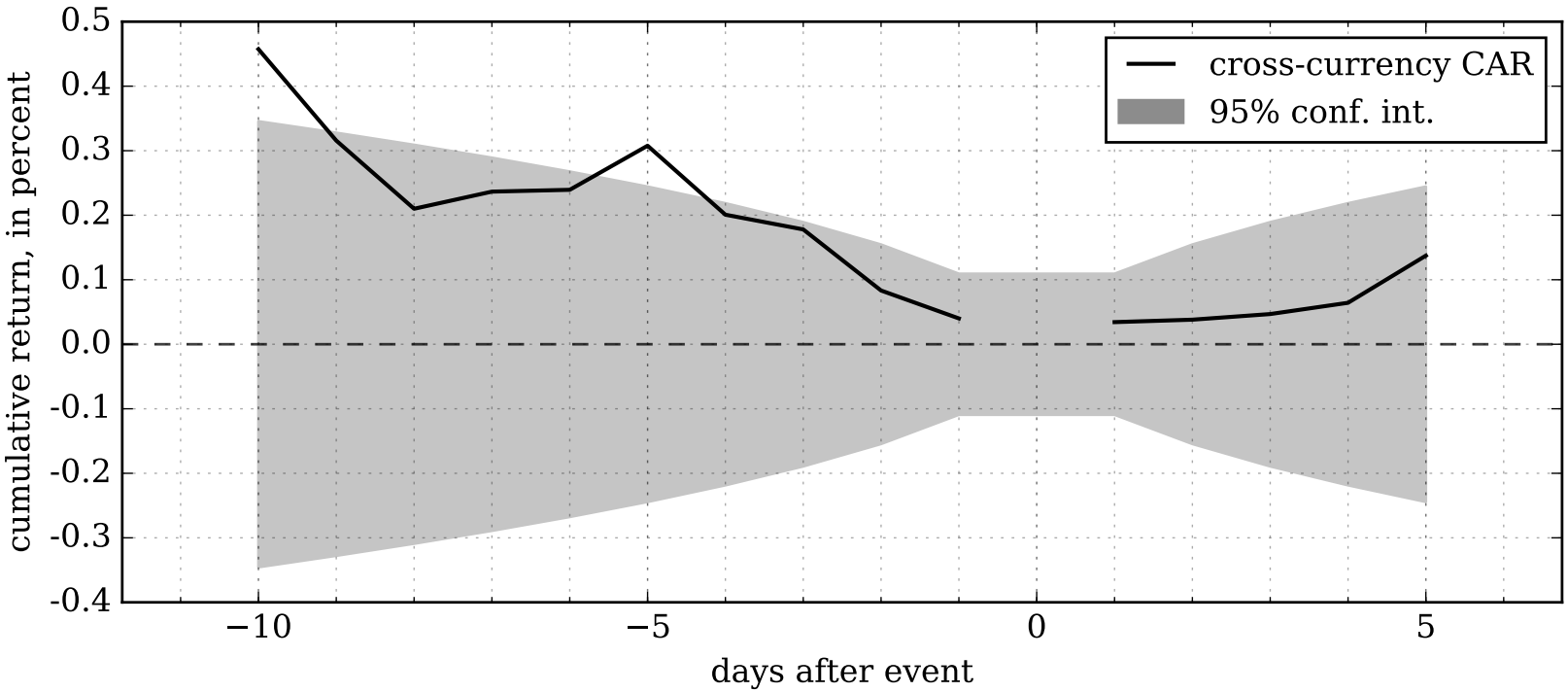
xxxusd before announcements

hikes, single currencies



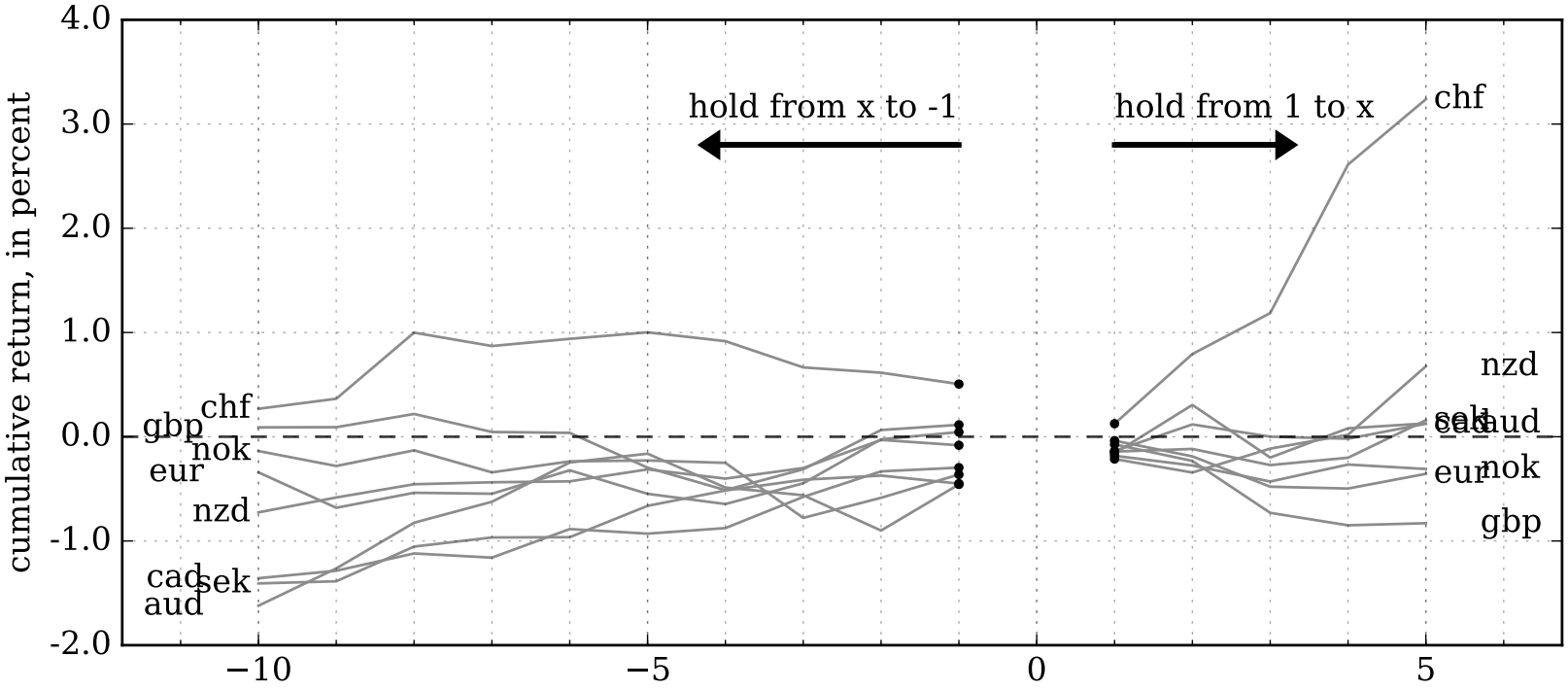
xxxusd before announcements

hikes, average



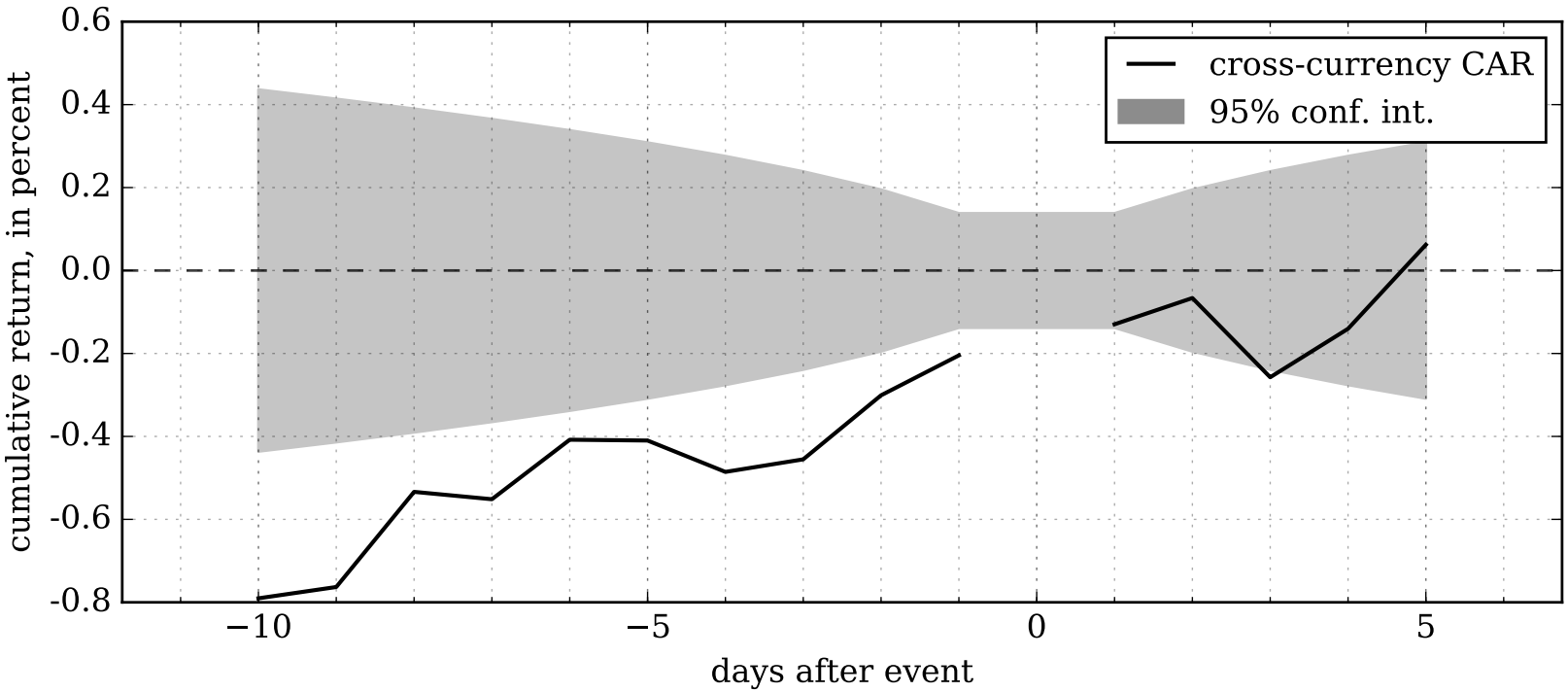
xxxusd before announcements

cuts, single currencies



xxxusd before announcements

cuts, average



exploiting the pattern

idea

- long positions in currencies (against usd) before hikes;
- short positions before cuts;
- long position in usd against all before fomc hikes;
- short position in usd against all before fomc cuts;
- close positions one day before announcement.

exploiting the pattern

example: rate decisions

date	aud	gbp	nzd	usd
Wed, 25/8				
Thu, 26/8				
Tue, 24/9				
Wed, 25/9				
Thu, 26/9				
Tue, 24/10				
Wed, 25/10				
Thu, 26/10				
Fri, 27/10				
Mon, 30/10				
Tue, 31/10				
Wed, 1/11				0
Thu, 2/11		+1		
Fri, 3/11				

exploiting the pattern

example: actions

date	aud	gbp	nzd	usd
Wed, 25/8				
Thu, 26/8		open		
Tue, 24/9		hold		
Wed, 25/9		hold		
Thu, 26/9		hold		
Tue, 24/10		hold		
Wed, 25/10		hold		
Thu, 26/10		hold		
Fri, 27/10		hold		
Mon, 30/10		hold		
Tue, 31/10		hold		
Wed, 1/11		close		
Thu, 2/11				
Fri, 3/11				

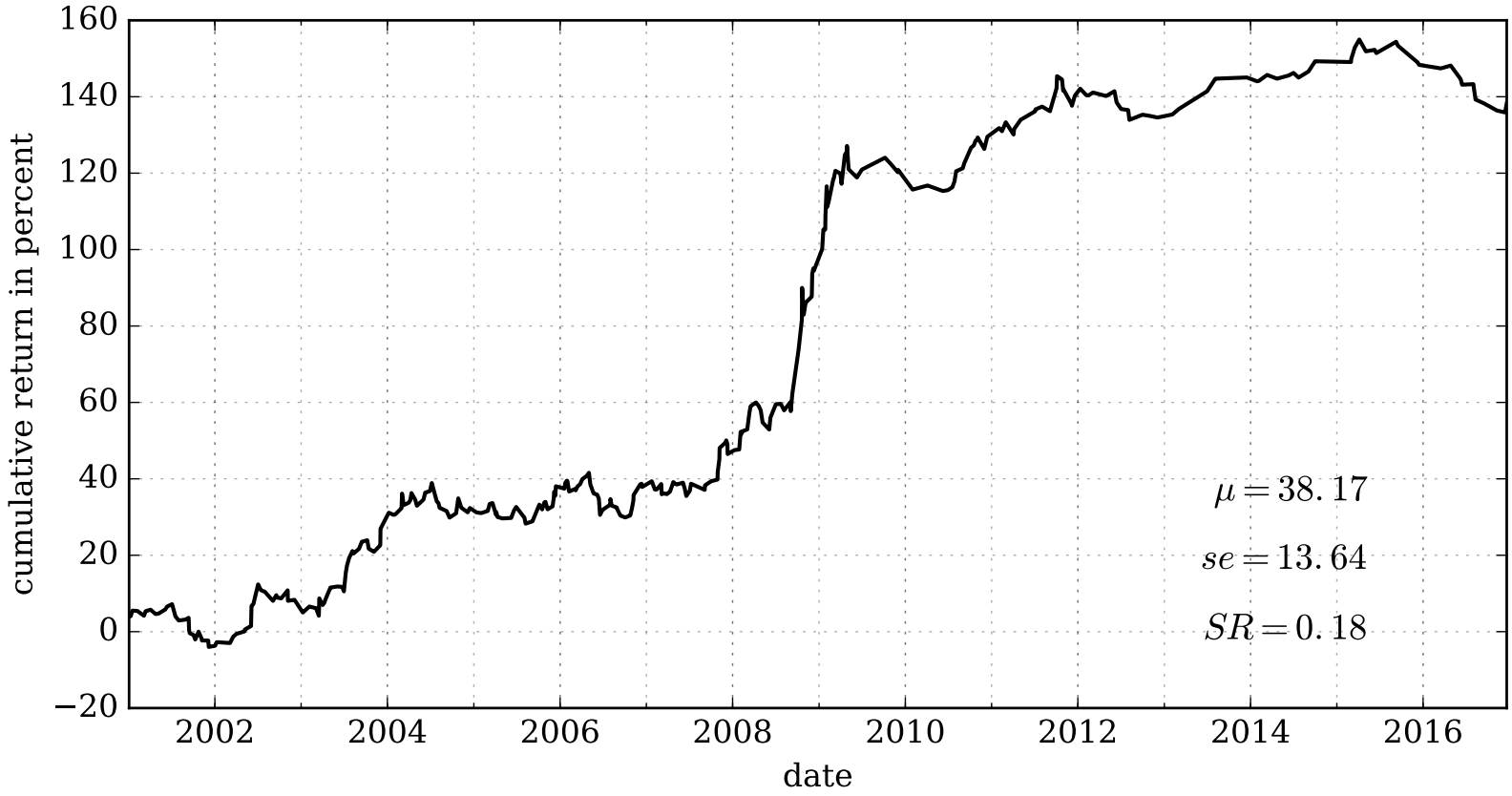
exploiting the pattern

excess returns and bid-ask adjustment

- positions are opened at ask prices, closed at bid prices;
- on all open positions swap points are credited daily;
- set-up similar to retail forex.

exploiting the pattern

perfect foresight, excess returns after costs



predicting policy rate decisions

a systemic way

- detect event at future date t^*;
- find traded derivative of future policy rate with $\tau > t^*$;
- invert pricing function to extract implied rate;
- predict hike if implied rate $\geq$ today's rate + threshold.

$\Rightarrow$ same as with federal funds futures

overnight index swaps

traded derivative

- exchange future cumulative o/n rate for fixed payment
- introduced in most developed economies;
- super liquid;
- priced as expectation of future cumulative o/n rate:

$$w_t = \mathbb{E}_t \left[\prod_{s=t+1}^{\tau} (1 + r_s) \right],$$

where τ is maturity, w_t is fixed leg rate.

overnight index swaps

o/n rates vs. policy target rates

$\Rightarrow$ not necessary the same, but:

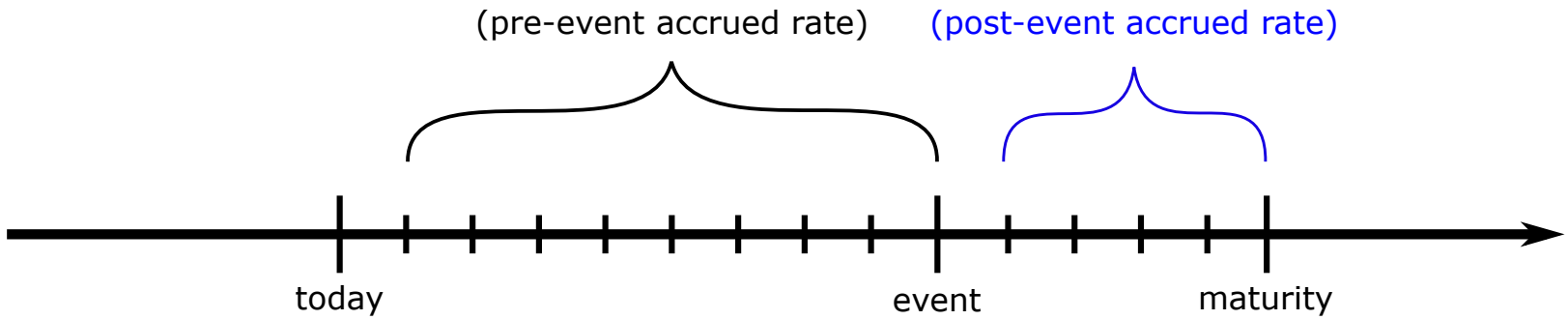
- australia, new zealand, usa: coincide
- canada, sweden, uk: very close
- euro zone, switzerland: close enough

recovery of implied rates

from ois rates

$$w_t = \mathbb{E}_t \left[\prod_{s \le t^*} (1 + r_s) \prod_{s > t^*} (1 + r_s^*) \right],$$

where r_s^* is post-event rate on day s.



recovery of implied rates

abuse of math

- rates stay constant;
- rate before event is known;
- jensen's inequality holds as equality.

$$\mathbb{E}_t[r^*] = f(\text{ois fixed rate and today's o/n rate})$$

predicting hikes and cuts

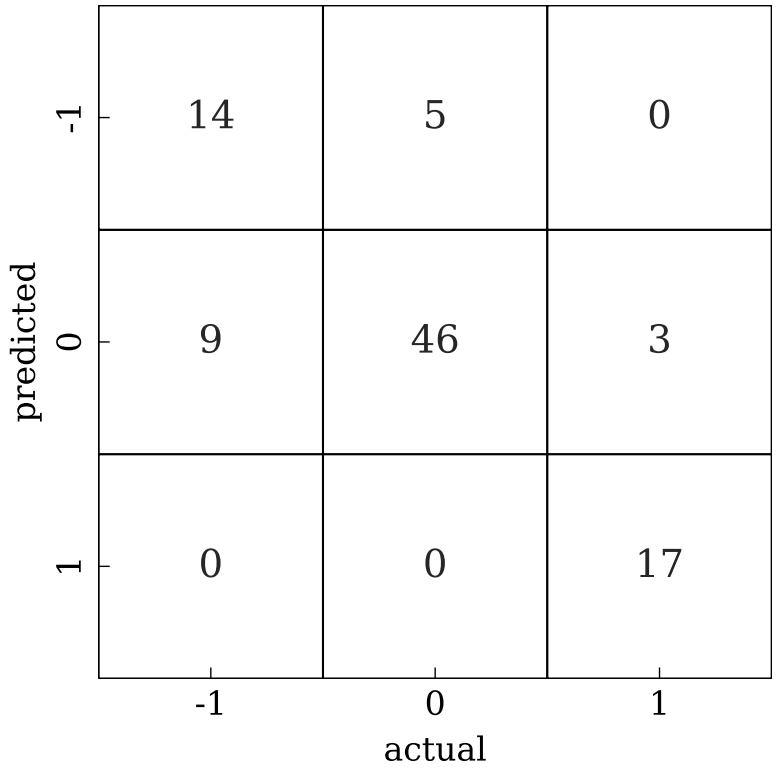
threshold-based rule

$$\mathbb{E}_t[\text{decision}] = \begin{cases} \text{hike}, & \text{if (implied - today's)} \geq h, \\ \text{cut}, & \text{if (implied - today's)} < -h, \\ \text{status quo}, & \text{otherwise} \end{cases}$$

predicting policy rate decisions

evidence it works in sweden

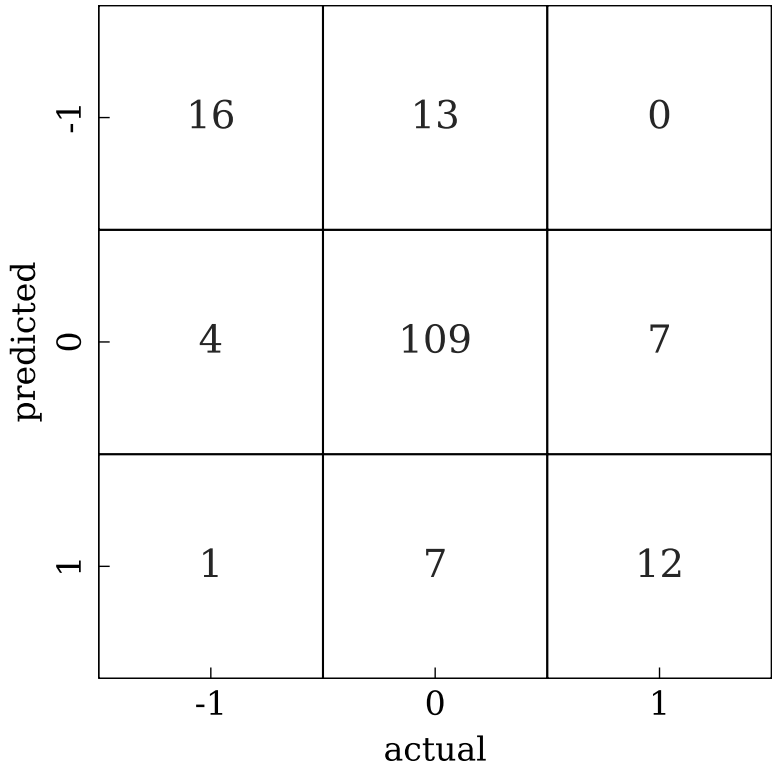
$\Rightarrow$ 10 days before meetings, using $h = 10$bps



predicting policy rate decisions

evidence it works in australia

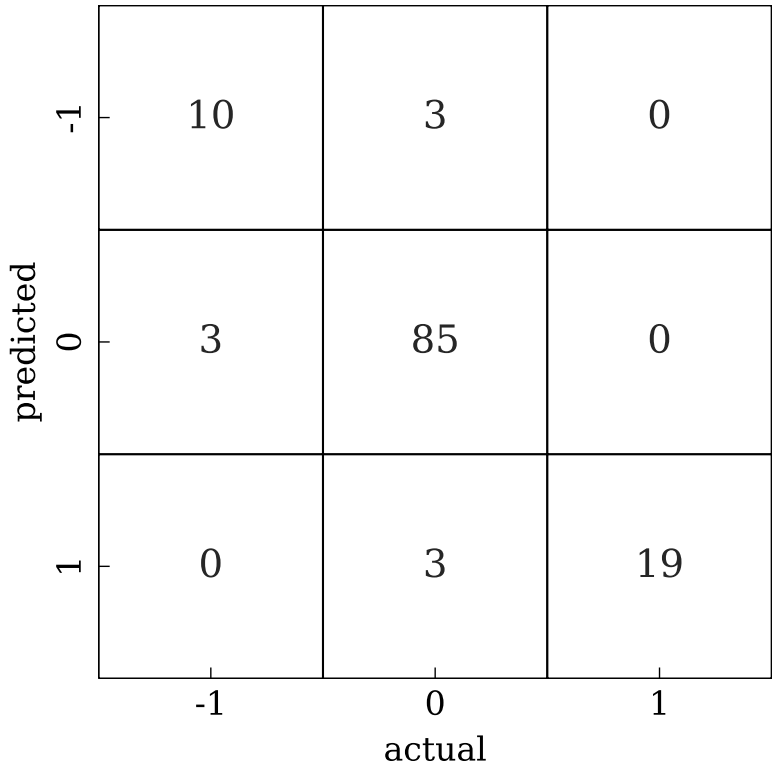
$\Rightarrow$ 10 days before meetings, using $h = 10$bps



predicting policy rate decisions

evidence it works in the usa

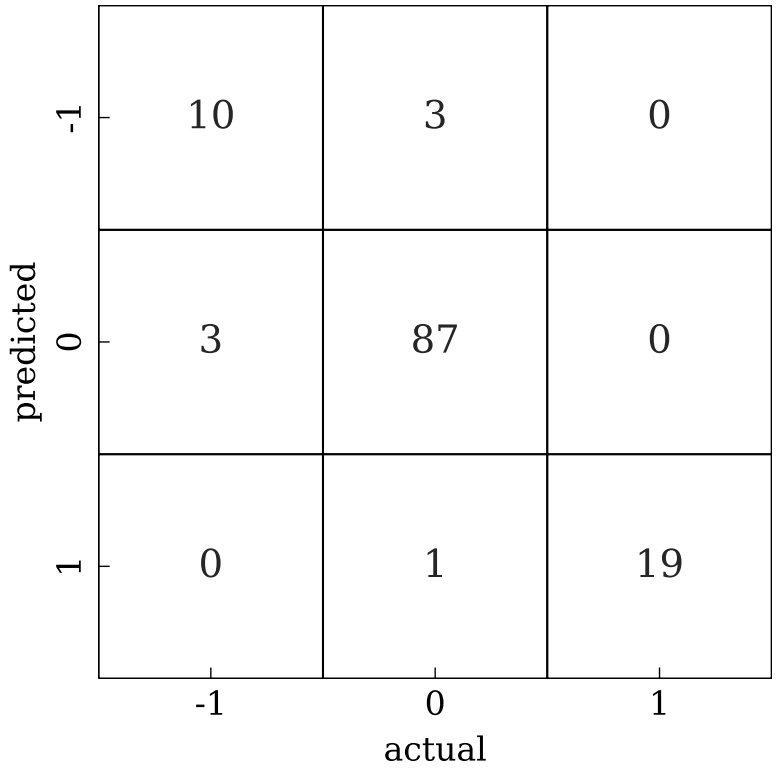
$\Rightarrow$ 10 days before meetings, using $h = 10$bps



predicting policy rate decisions

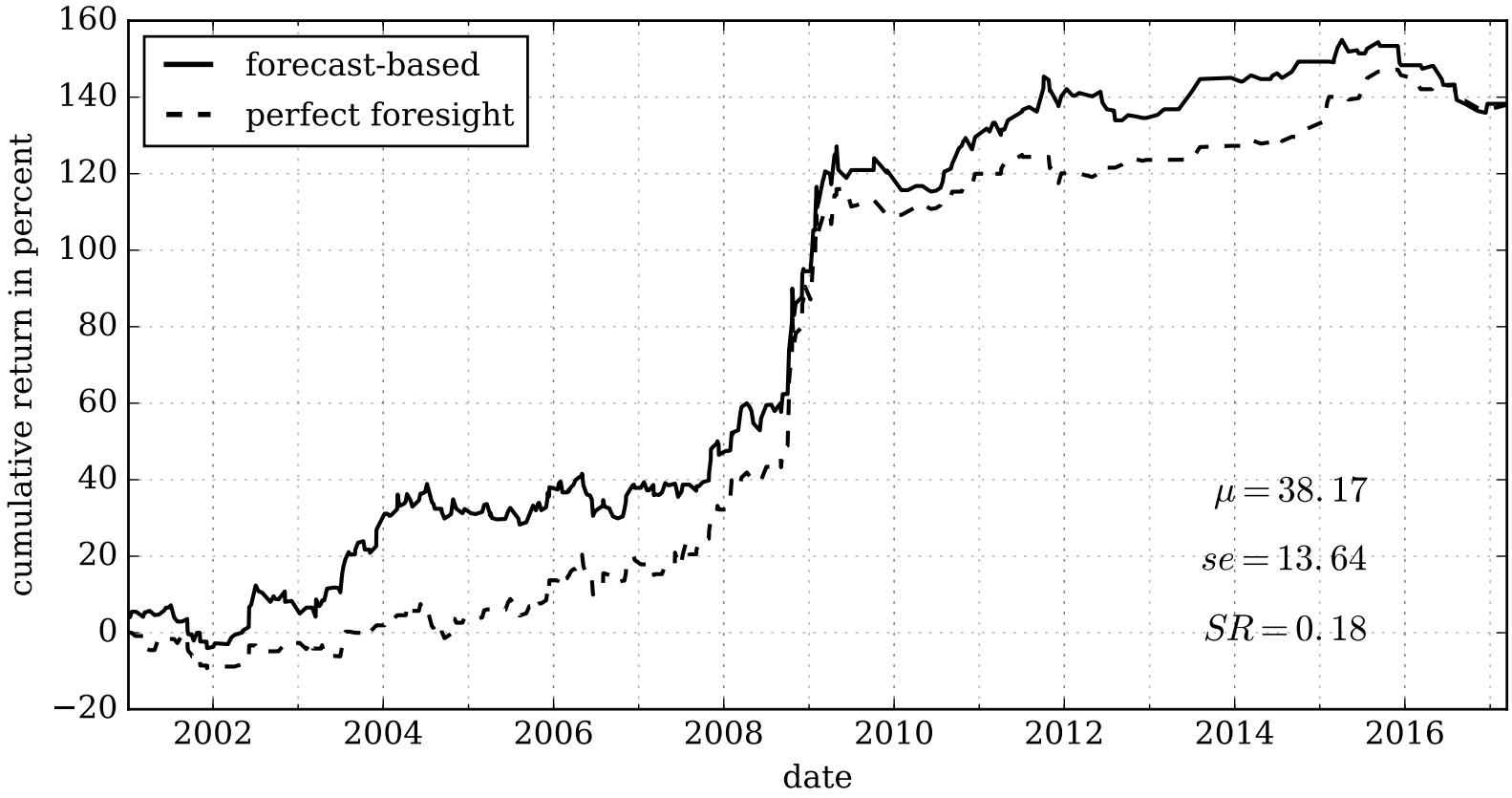
usa, federal funds futures

$\Rightarrow$ 10 days before meetings, using $h = 10$bps



exploiting the pattern

(im)perfect foresight, excess returns after costs



robustness checks

what could have gone wrong

Problems:

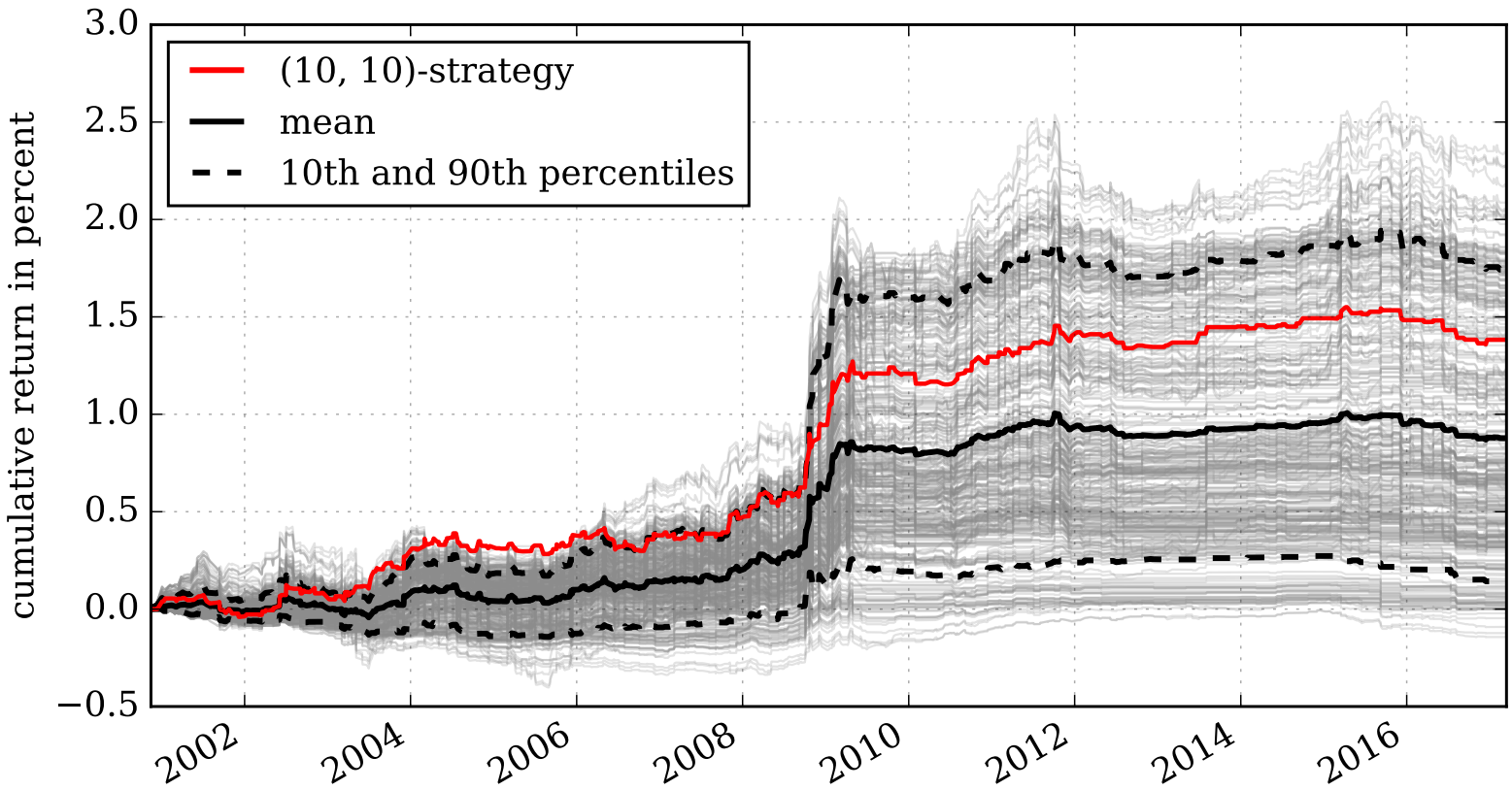
- arbitrary holding period p and prediction threshold h;
- positions are opened without partially closing the others;

Solutions:

- construct strategies for many possible values of (p, h);
- restrict leverage, make strategy comparable with carry etc;

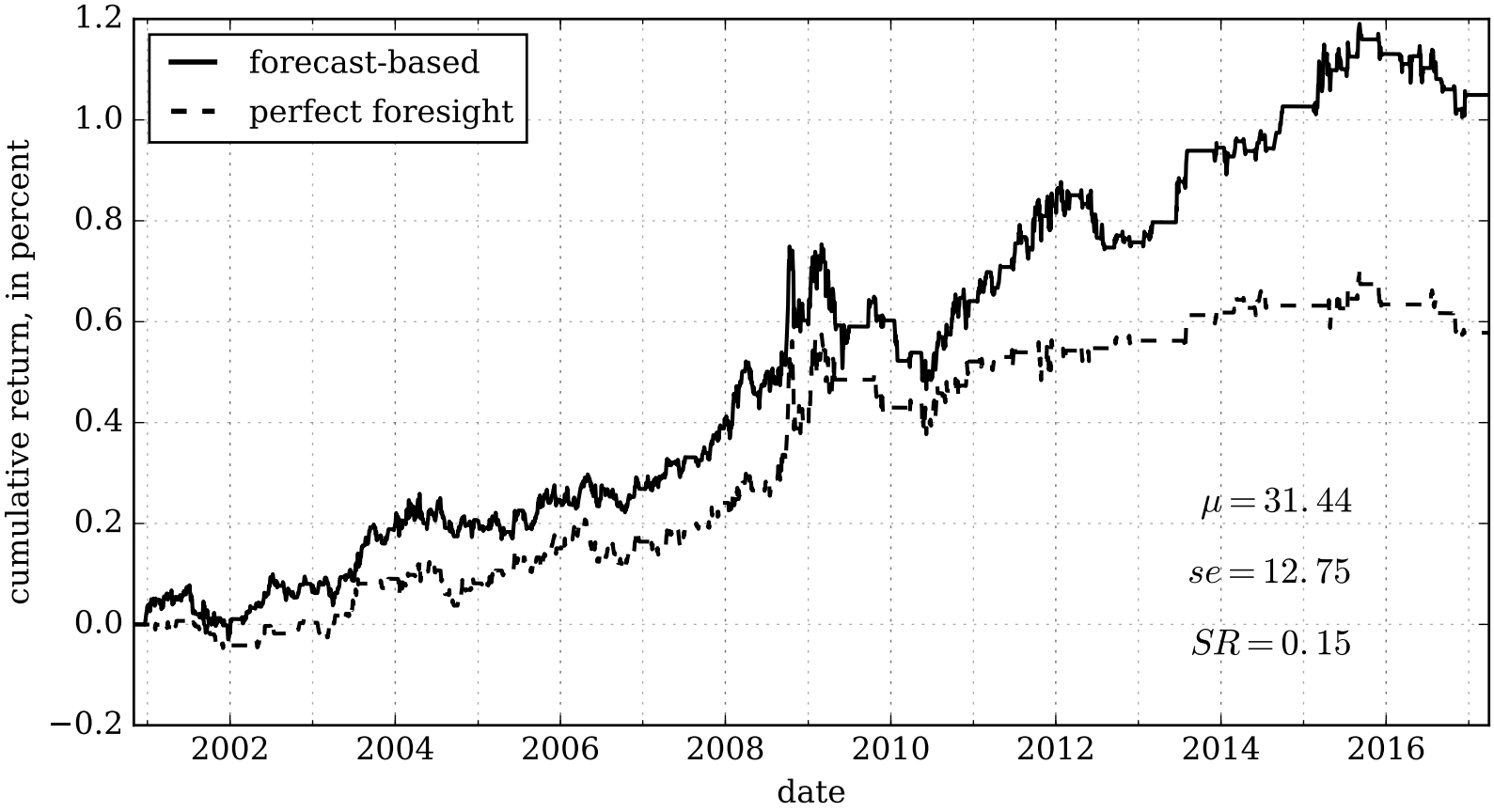
robustness checks

choice of holding period and prediction threshold



robustness checks

restricted leverage



the end

the end

references

Karnaukh, Nina, 2016, The dollar ahead of FOMC target rate changes, *Job Market Paper* .

Lucca, David O, and Emanuel Moench, 2015, The pre-FOMC announcement drift, *The Journal of Finance* 70, 329–371.

Mueller, Philippe, Alireza Tahbaz-Salehi, and Andrea Vedolin, 2017, Exchange rates and monetary policy uncertainty, *The Journal of Finance* .

appendix

robustness checks

restricted leverage: why

date	aud	gbp	nzd	usd
Wed, 25/8				
Thu, 26/8				
Tue, 24/9				
Wed, 25/9				
Thu, 26/9				
Tue, 24/10				
Wed, 25/10				
Thu, 26/10				
Fri, 27/10				
Mon, 30/10				
Tue, 31/10				
Wed, 1/11			+1	
Thu, 2/11		+1		
Fri, 3/11				

robustness checks

restricted leverage: why (cont.)

date	aud	gbp	nzd	usd
Wed, 25/8			open	
Thu, 26/8		open	hold	
Tue, 24/9		hold	hold	
Wed, 25/9		hold	hold	
Thu, 26/9		hold	hold	
Tue, 24/10		hold	hold	
Wed, 25/10		hold	hold	
Thu, 26/10		hold	hold	
Fri, 27/10		hold	hold	
Mon, 30/10		hold	hold	
Tue, 31/10		hold	close	
Wed, 1/11		close		
Thu, 2/11				
Fri, 3/11				

robustness checks

restricted leverage: why (cont.)

date	aud	gbp	nzd	usd
Wed, 25/8				
Thu, 26/8			$1	
Tue, 24/9		$1	$1	
Wed, 25/9		$1	$1	
Thu, 26/9		$1	$1	
Tue, 24/10		$1	$1	
Wed, 25/10		$1	$1	
Thu, 26/10		$1	$1	
Fri, 27/10		$1	$1	
Mon, 30/10		$1	$1	
Tue, 31/10		$1	$1	
Wed, 1/11		$1		
Thu, 2/11				
Fri, 3/11				

robustness checks

restricted leverage: why (cont.)

date	aud	gbp	nzd	usd
Wed, 25/8				
Thu, 26/8			$1	
Tue, 24/9		$0.5	$0.5	
Wed, 25/9		$0.5	$0.5	
Thu, 26/9		$0.5	$0.5	
Tue, 24/10		$0.5	$0.5	
Wed, 25/10		$0.5	$0.5	
Thu, 26/10		$0.5	$0.5	
Fri, 27/10		$0.5	$0.5	
Mon, 30/10		$0.5	$0.5	
Tue, 31/10		$0.5	$0.5	
Wed, 1/11		$1		
Thu, 2/11				
Fri, 3/11				

robustness checks

restricted leverage: why (cont.)

date	aud	gbp	nzd	usd
Wed, 25/8				
Thu, 26/8			+$1	
Tue, 24/9		+$0.5	-$0.5	
Wed, 25/9				
Thu, 26/9				
Tue, 24/10				
Wed, 25/10				
Thu, 26/10				
Fri, 27/10				
Mon, 30/10				
Tue, 31/10			-$0.5	
Wed, 1/11		-$0.5		
Thu, 2/11				
Fri, 3/11				