

Cross Currency Swaps

A forward FX rate is calculated using a no-arbitrage pricing model

Assume a US-based investor has US\$10.50 million to invest and a 12-mo time horizon. The current rates in the market are as follows

Spot AUD/USD rate	1.0500
12-mo USD rate	0.65%
12-mo AUD rate	3.62%

The investor is faced with **two** investment choices, being:

Alternative 1
<ul style="list-style-type: none"> Invest US\$10.50 mm for 12 mo at 0.65% FX risk = none

Alternative 2
<ul style="list-style-type: none"> Exchange US\$10.50 mm at the spot rate and invest proceeds of A\$10.00 mm for 12 mo at 3.62%. FX risk = AUD depreciates against the USD

Alternative 1		Alternative 2	
t_0	Invest \$10,500,000 for 12 mo @ 0.65%	t_0	Invest A\$10,000,000 for 12 mo @ 3.62%
t_1	Principal \$10,500,000	t_1	Principal A\$10,000,000
	Interest (Act/360 basis) \$69,198		Interest (Act/365 basis) A\$362,000
	\$10,569,198		A\$10,362,000
Breakeven Rate = $\frac{10,569,198}{10,362,000}$		$\frac{10,569,198}{10,362,000} = 1.0200$	

The forward FX formula can be distilled as follows

- The general forward rate formula is represented by the following:

$$\text{Forward FX Rate} = \text{Spot} \times \frac{1 + (r_T \times t)}{1 + (r_U \times t)}$$

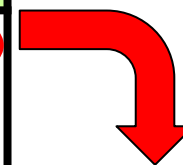
where

r_T = int. rate of the *term* currency

r_U = int. rate of the *unit* currency

t = time period

Ccy	Spot	1 mo	2 mo	3 mo	6 mo	12 mo
AUD	1.0500	- 0.0025	- 0.0050	- 0.0076	- 0.0153	- 0.0300
CAD	1.0250	+ 0.0006	+ 0.0014	+ 0.0020	+ 0.0042	+0.0080
CHF	0.9460	- 0.0002	- 0.0006	- 0.0010	- 0.0025	- 0.0058
EUR	1.3000	+ 0.0003	+ 0.0005	+ 0.0009	+ 0.0018	+ 0.0038
GBP	1.5000	- 0.0002	- 0.0005	- 0.0008	- 0.0012	- 0.0018
JPY	96.00	- 0.02	- 0.04	- 0.07	- 0.14	- 0.38
NZD	0.8240	- 0.0016	- 0.0034	- 0.0048	- 0.0100	- 0.0205
SGD	1.2500	0.0000	0.0000	0.0000	0.0000	- 0.0008



Spot	1.0500
Forward points	- 0.0300
Forward outright	1.0200

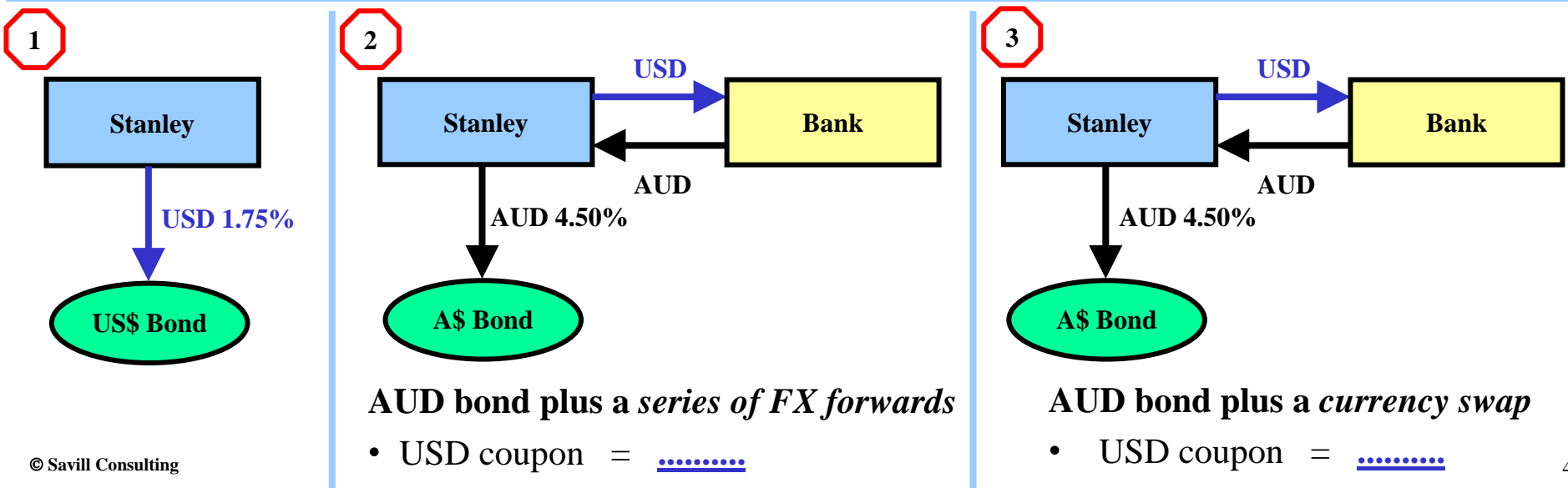
Stanley Corp. requires 5-year USD financing

Date: March 2013

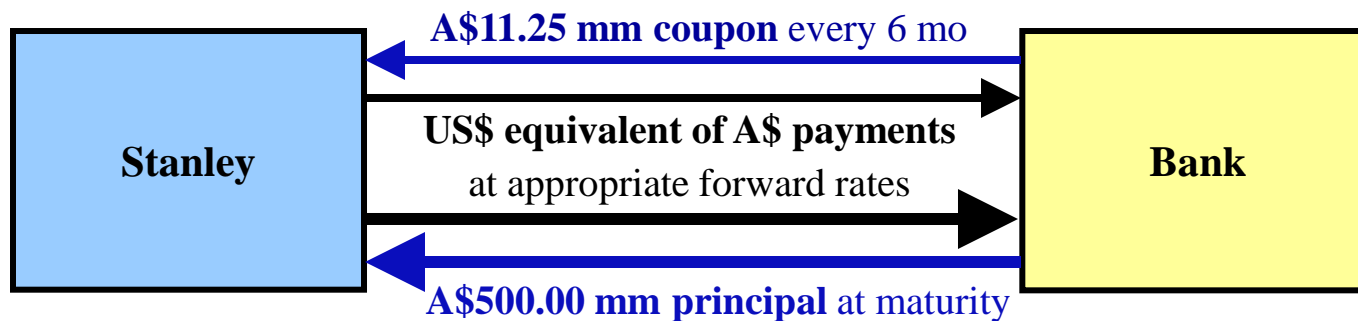
Stanley Corp., a Hong Kong-based (and therefore considered a USD-referenced) company, wishes to borrow US\$525 million over 5-years which they could do by issuing a USD bond with an indicated coupon of 1.75%.

However, they have been informed by their bankers that there are some good opportunities in the *kangaroo* market: it has been suggested that they issue an AUD bond in A\$500 million instead (the equivalent of US\$525 million at the current exchange rate of 1.0500) with a coupon of 4.50%, and swap back into USD using:

- (a) a series of FX forwards, *or*
- (b) a cross currency swap

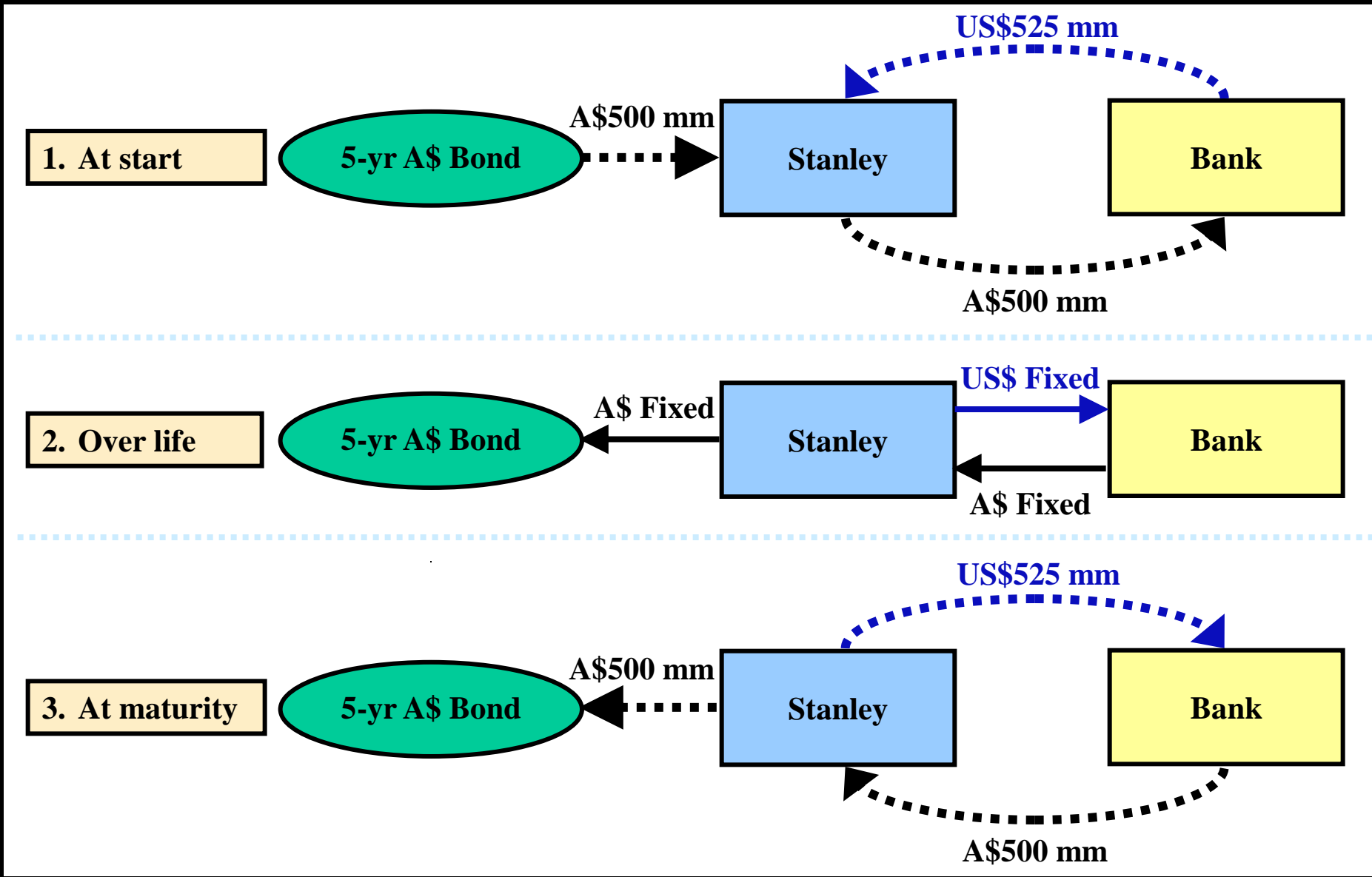


2. AUD bond plus a series of FX forwards: USD cost



Tenor	AUD coupon & principal	FX Rate	Cash Flow in USD
Spot	- 500,000,000	1.0500	525,000,000
6-mo	11,250,000	1.0347	-11,640,860
12-mo	11,250,000	1.0200	-11,474,954
18-mo	11,250,000	1.0065	-11,322,834
24-mo	11,250,000	0.9947	-11,190,193
30-mo	11,250,000	0.9806	-11,031,847
36-mo	11,250,000	0.9665	-10,872,609
42-mo	11,250,000	0.9541	-10,733,143
48-mo	11,250,000	0.9421	-10,598,206
54-mo	11,250,000	0.9303	-10,465,323
60-mo	511,250,000	0.9188	-469,725,623
IRR%	4.50%		1.78%

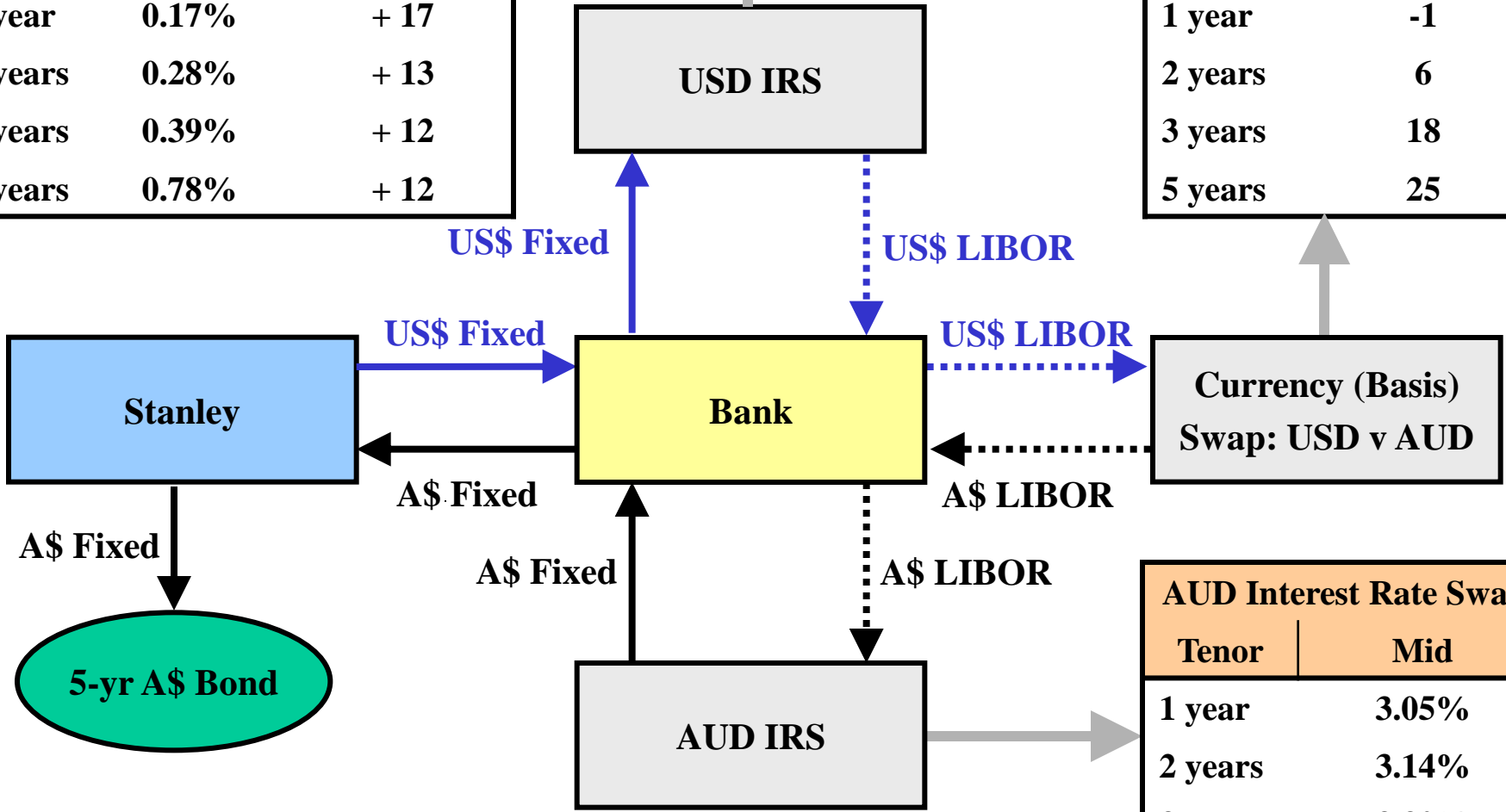
3. AUD bond plus a currency swap: USD cost



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USD Interest Rate Swap		
Tenor	Treasury	Mid Spread
1 year	0.17%	+ 17
2 years	0.28%	+ 13
3 years	0.39%	+ 12
5 years	0.78%	+ 12

USD/AUD Basis Swap	
Tenor	A\$ Spread
1 year	-1
2 years	6
3 years	18
5 years	25

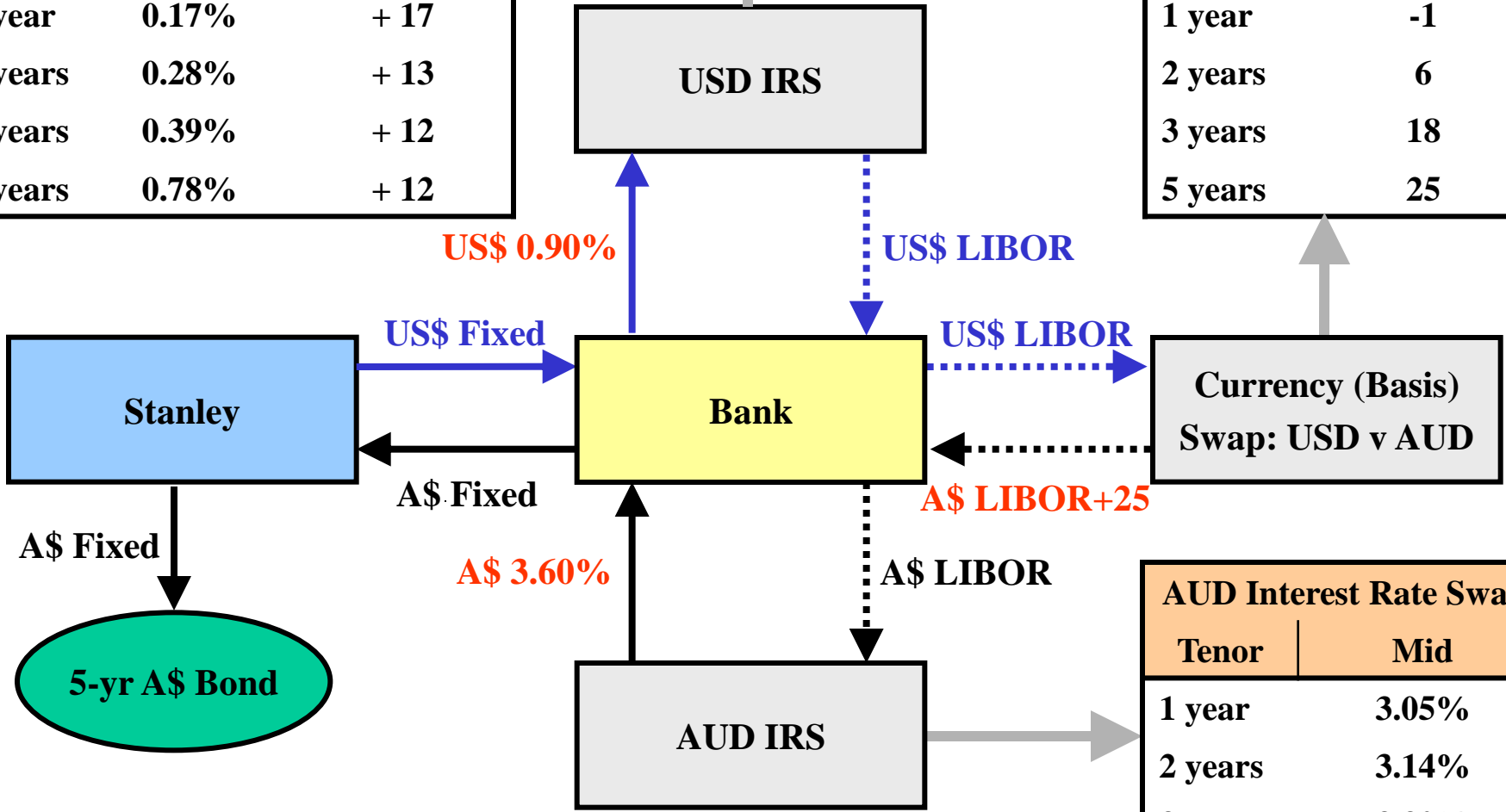


AUD Interest Rate Swap	
Tenor	Mid
1 year	3.05%
2 years	3.14%
3 years	3.30%
5 years	3.60%

3. AUD bond plus a currency swap: USD cost

USD Interest Rate Swap		
Tenor	Treasury	Mid Spread
1 year	0.17%	+ 17
2 years	0.28%	+ 13
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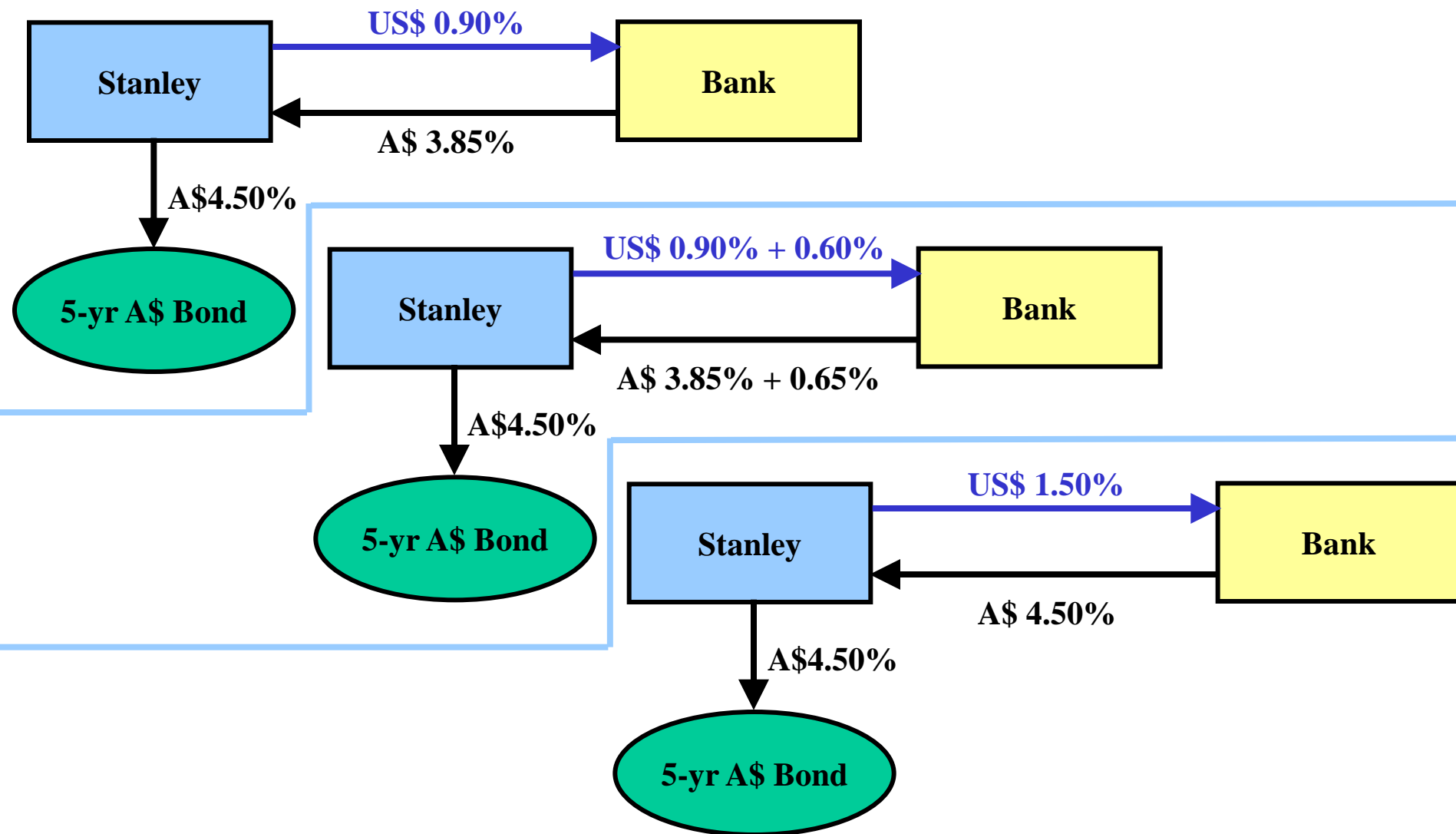
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Tenor	Mid
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3 years	3.30%
5 years	3.60%

3. AUD bond plus a currency swap: USD cost

The bank is left with the following net position under the swap



A comparison between FX forwards and a currency swap

Cash Flows and IRR under a series of **spot and forward FX deals**

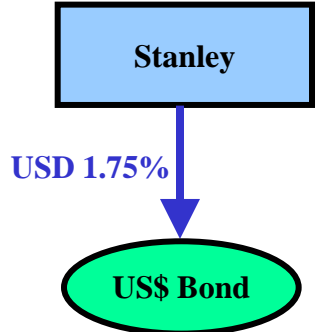
Tenor	AUD coupon and principal	FX Rate	Cash Flow in USD
Spot	-500,000,000	1.0500	525,000,000
6-mo	11,250,000	1.0347	-11,640,860
12-mo	11,250,000	1.0200	-11,474,954
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IRR%	4.50%		1.78%

Cash Flows and IRR under the **currency swap**

Tenor	AUD coupon and principal	FX Rate	Cash Flow in USD
Spot	-500,000,000	01.0500	525,000,000
6-mo	11,250,000		-3,937,500
12-mo	11,250,000		-3,937,500
18-mo	11,250,000		-3,937,500
24-mo	11,250,000		-3,937,500
30-mo	11,250,000		-3,937,500
36-mo	11,250,000		-3,937,500
42-mo	11,250,000		-3,937,500
48-mo	11,250,000		-3,937,500
54-mo	11,250,000		-3,937,500
60-mo	511,250,000		-528,937,500
IRR%	4.50%		1.50%

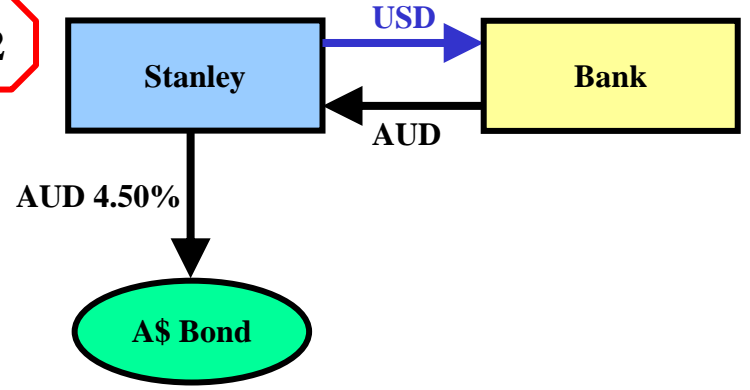
Summary: Stanley's funding cost in USD

1



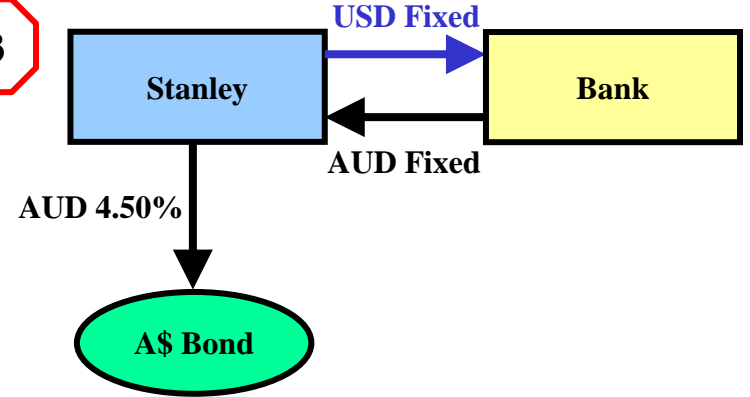
USD Bond
 Coupon = 1.75%

2



AUD bond plus a series of *FX forwards*
 USD coupon = 1.78%

3



AUD bond in combination with a *currency swap*
 USD coupon = 1.50%