

Understanding South African Financial Markets

Chapter 13: The derivatives market



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Study outcomes

The objective of this chapter is to provide an overview of the concepts, instruments and participants in the derivatives market with particular reference to South Africa.

When you have studied this chapter you should be able to

- define derivative instruments
- understand the characteristics of the derivatives market
- define and discuss the features and application of forwards, futures, options and swaps
- list the participants in the derivatives market and understand their roles
- discuss the risk management of derivatives
- explain derivatives market information.



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Introduction

Overview

- Financial weapons of mass destruction?
- Derivatives defined
- Characteristics of derivatives markets
- Instruments
- Participants
- Risk management of derivatives
- Published market information

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Financial weapons of mass destruction?

*Table 13.1 Notional outstanding value of global derivatives market (USD trillion)
(Textbook page 396)*

Underlying market	Over the counter		Exchange traded	
	Dec-13	Dec-12	Dec-13	Dec-12
Foreign exchange	70,6	67,4	0,4	0,3
Interest rate	584,4	489,7	57,0	48,5
Equity linked	6,6	6,3	7,2	5,2
Commodity	2,2	2,6		
Credit default swaps	21,0	25,1		
Unallocated	25,5	41,6		
Total	710,3	632,7	64,6	54,1

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Financial weapons of mass destruction?

Table 13.2 Number of derivatives contracts traded on global exchanges (in millions) (Textbook page 397)

Underlying market	Global		JSE		JSE market share	
	2013	2012	2013	2012	2013	2012
Foreign exchange	1 759,2	1 694,2	34,3	16,9	1,9%	1,0%
Interest rate	3 320,2	2 927,1	3,7	2,8	0,1%	0,1%
Equity linked	10 112,2	10 755,6	57,6	58,7	0,6%	0,5%
Commodity	3 286,1	2 714,6	2,8	3,0	0,1%	0,1%
Total	18 477,8	18 091,4	98,3	81,3	0,5%	0,4%

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Derivatives defined

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Characteristics of derivatives markets



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Instruments

- *Forwards and futures*
- *Options*
- *Swaps*

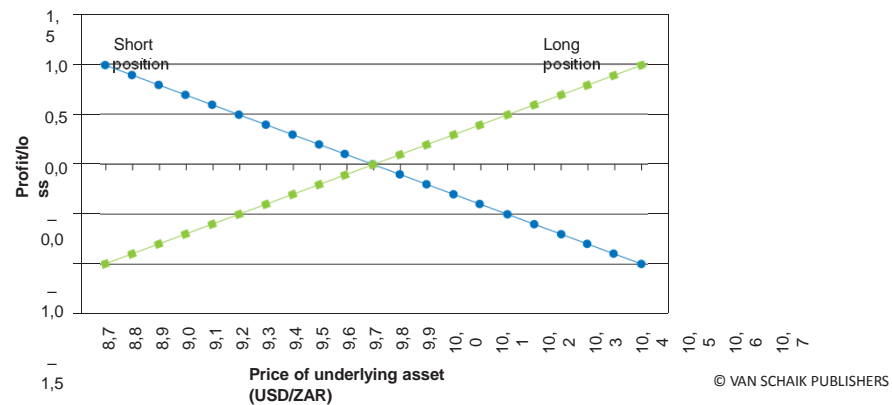


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Forwards and futures

- **Definition**
- **Forwards versus futures contracts**
- **Example of a forward transaction**

Figure 13.1 Payoff diagram of a long and short forward position
(Textbook page 400)

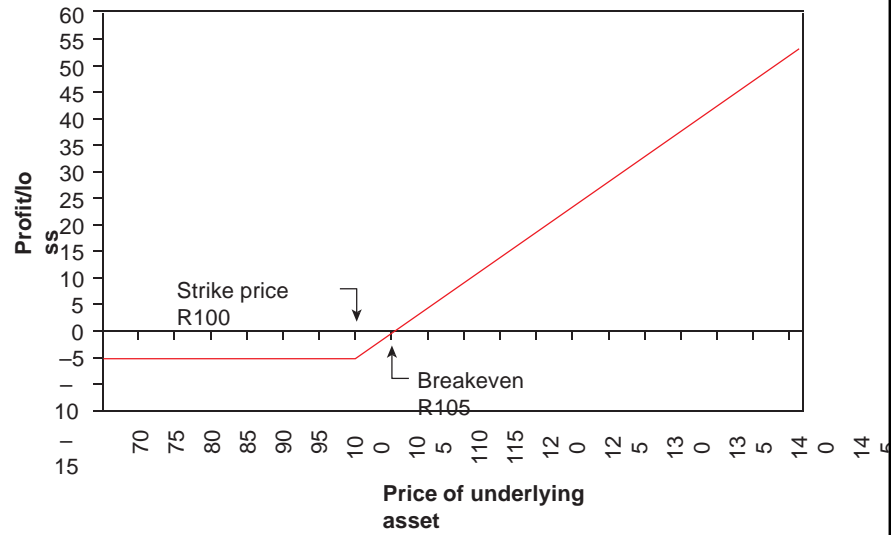


Forwards and futures

- **Examples of futures transactions**
 - Hedging
 - Speculating
- **Pricing futures and forwards**
 - [F.13.1](#)
 - [F.13.2](#)
 - [F.13.3](#)
 - [Box 13.1](#)
- **Basis**
- **Contango and backwardation**

Options

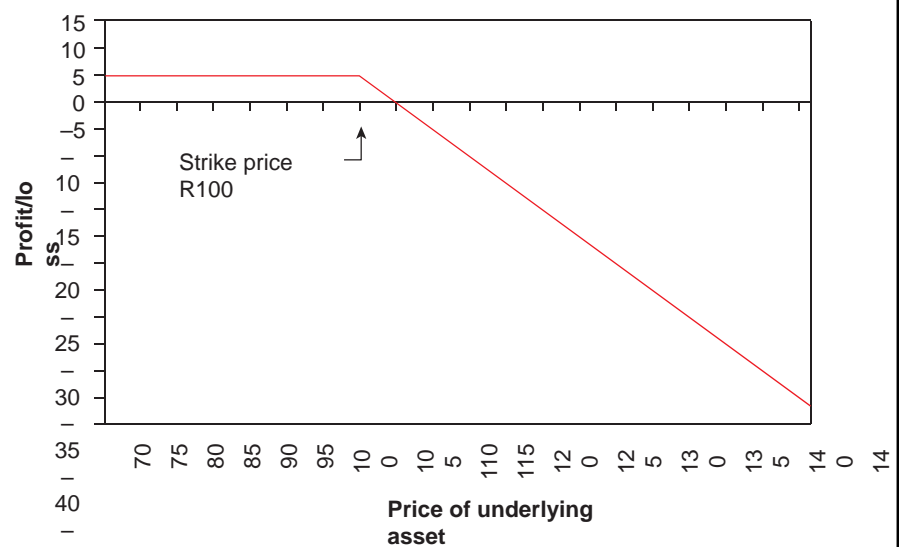
Figure 13.2 Payoff diagram for a long call option (Textbook page 406)



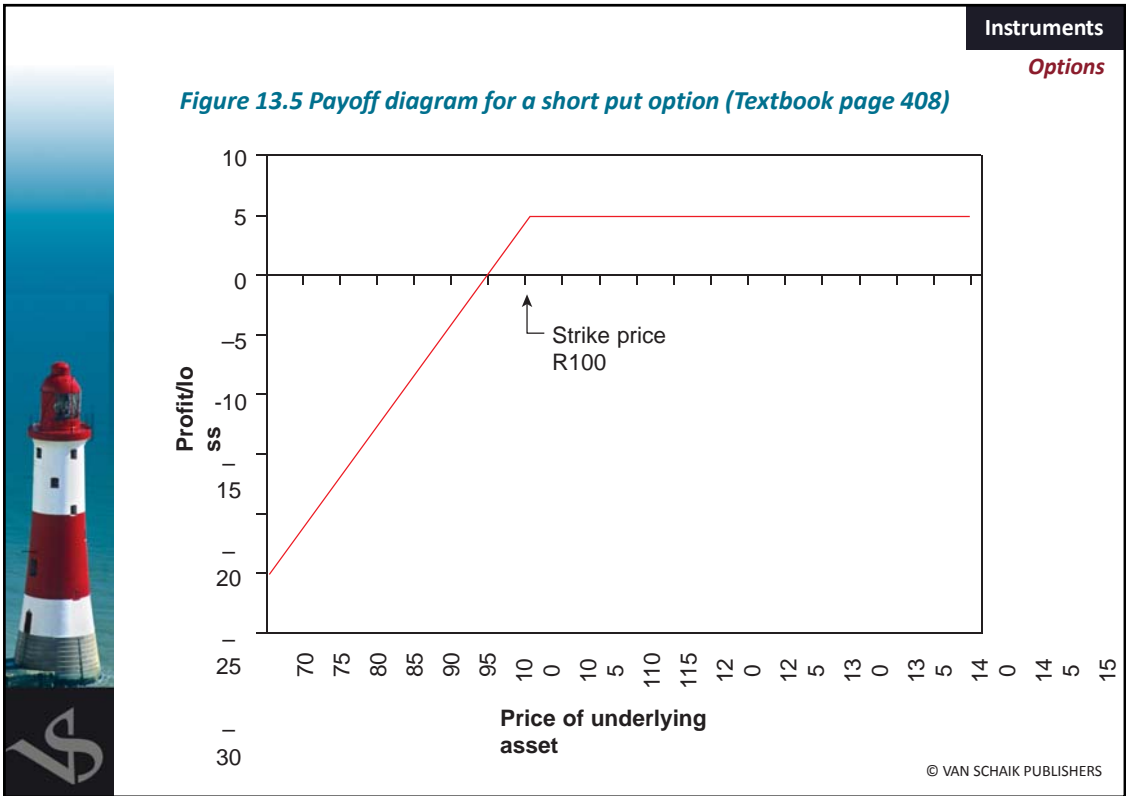
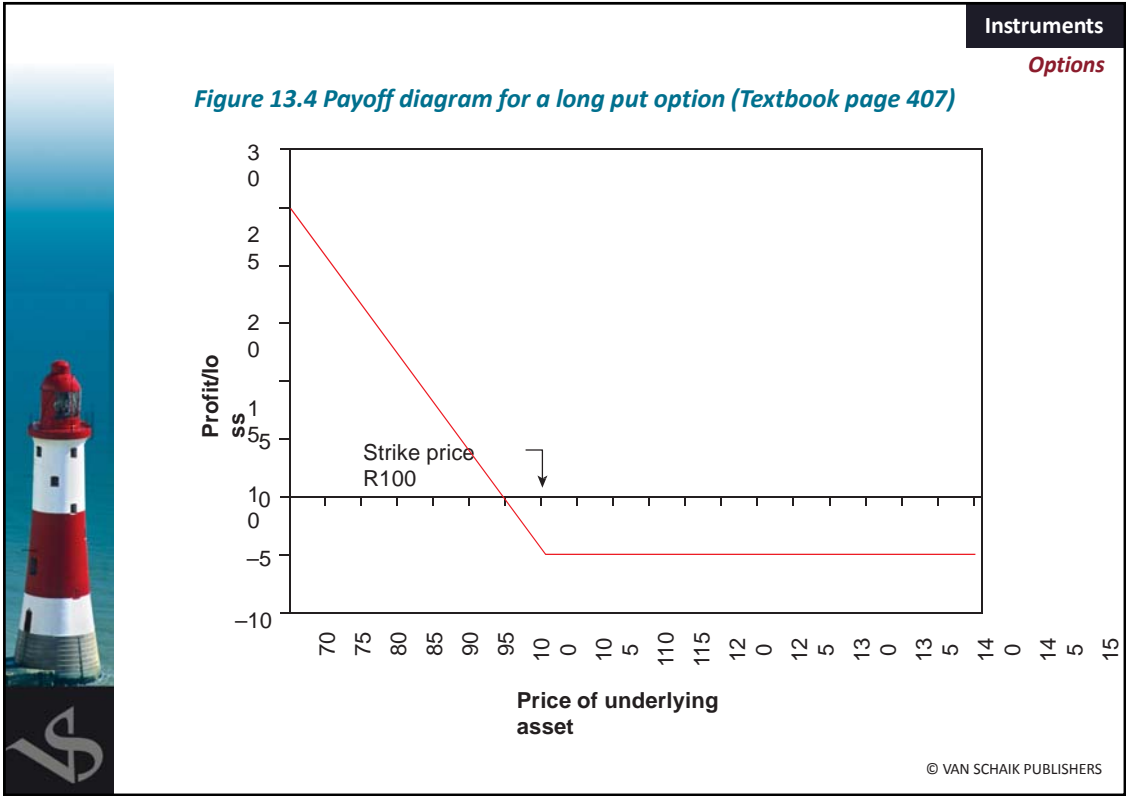
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Options

Figure 13.3 Payoff diagram for a short call option (Textbook page 407)



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Instruments

Options

Table 13.3 Effects of changing market conditions on the value of options
(Textbook page 408)

If ...	call premiums will ...	put premiums will ...	Reason
the price of the underlying rises	rise	fall	When the price of the underlying rises, the intrinsic value of a call (put) option increases (decreases).
the price of the underlying falls	fall	rise	When the price of the underlying falls, the intrinsic value of a call (put) option decreases (increases).
volatility* increases	rise	rise	The greater the volatility, the greater the likelihood that the price of the underlying will change.
volatility* decreases	fall	fall	The smaller the volatility, the smaller the likelihood that the price of the underlying will change.
time passes	fall	fall	As the time to expiration decreases, so does the probability that the asset price will be more or less than the strike price.
interest rates rise	fall slightly	fall slightly	The purchaser of an option pays the premium and brokerage fees up front to receive a potential profit some time in the future. If interest rates increase, the present value of the expected future profit declines while the implicit cost of the option increases.
interest rates fall	rise slightly	rise slightly	

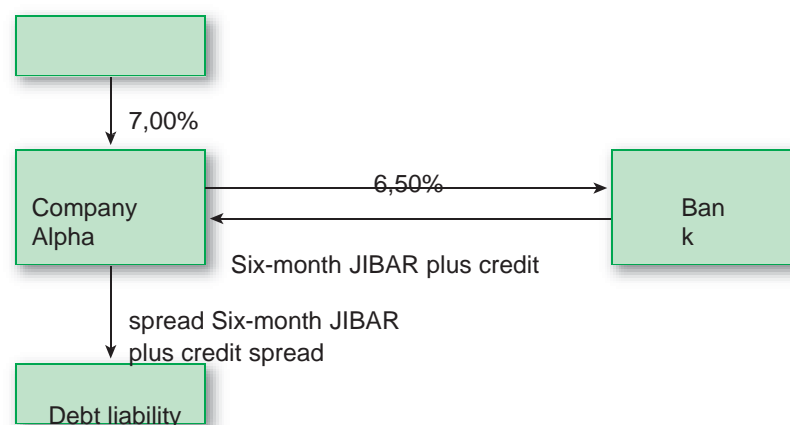
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Instruments

Swaps

- *Interest-rate swaps*

Figure 13.6 Hedging interest-rate risk (Textbook page 409)



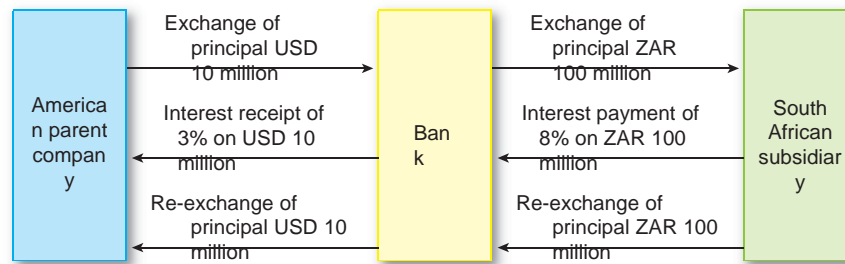
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Instruments

Swaps

- **Currency swaps**
- **Hedging exchange-rate risk**

Figure 13.7 Hedging exchange-rate risks (Textbook page 411)



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Instruments

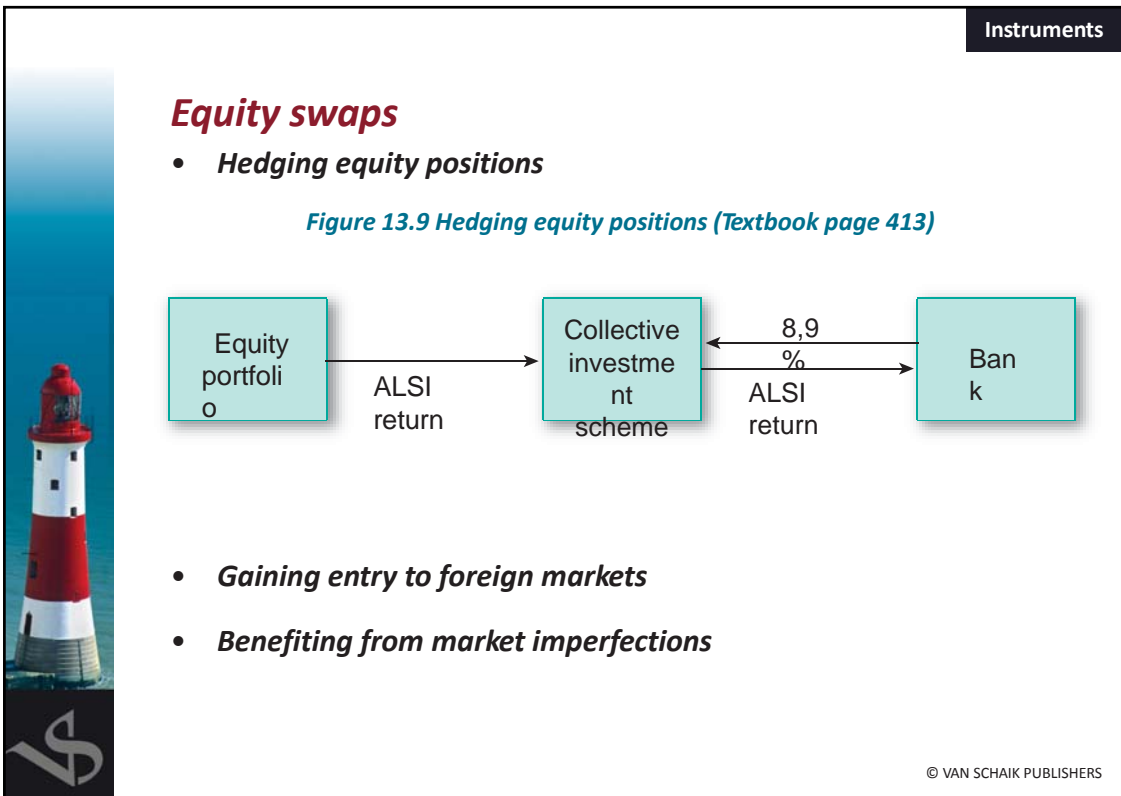
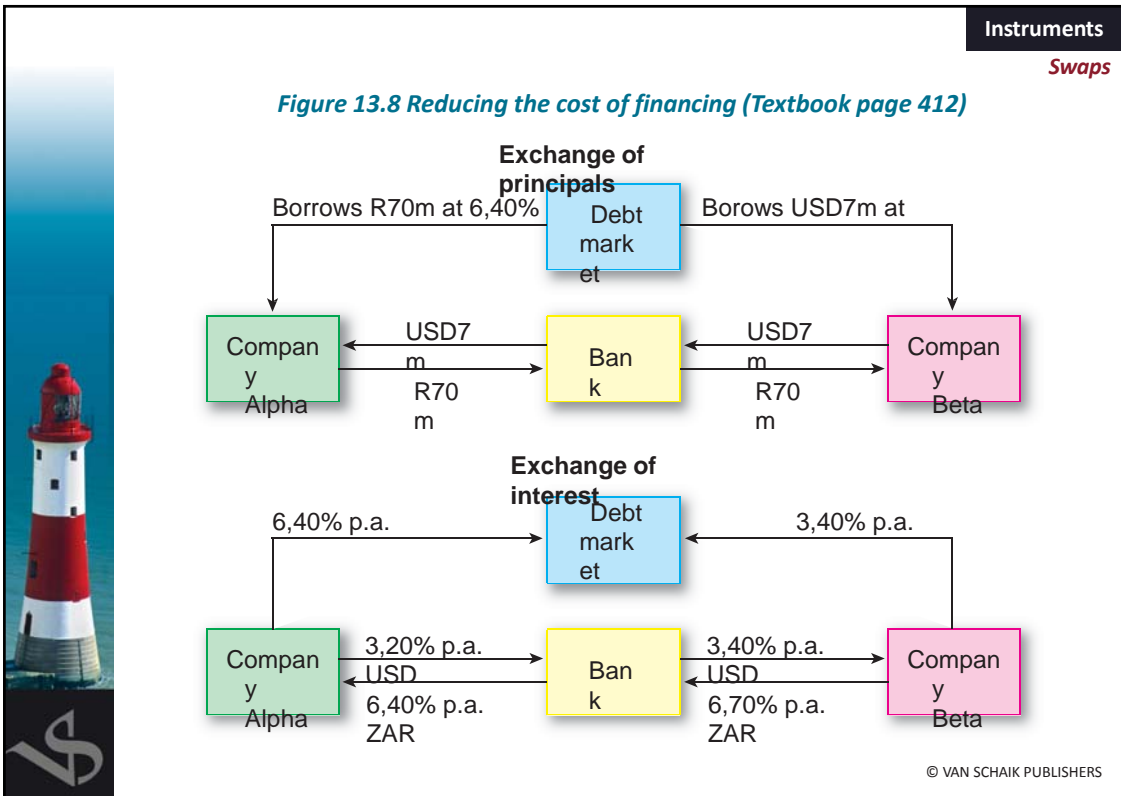
Swaps

- **Reducing the cost of financing**

Table 13.4 Borrowing rates of Alpha and Beta (Textbook page 412)

Currency	Possible borrowing rate			Borrowing rate after swap	
	Alpha	Beta	Spread	Alpha	Beta
ZAR	6,4%	6,8%	0,4%		6,7%
USD	3,3%	3,4%	0,1%	3,2%	

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Other derivatives

- Exotic derivatives
- Credit derivatives
- Weather derivatives
- Insurance derivatives



Derivatives instruments and leverage

Figure 13.10 Use of leverage – impact on position payoff files (Textbook page 416)

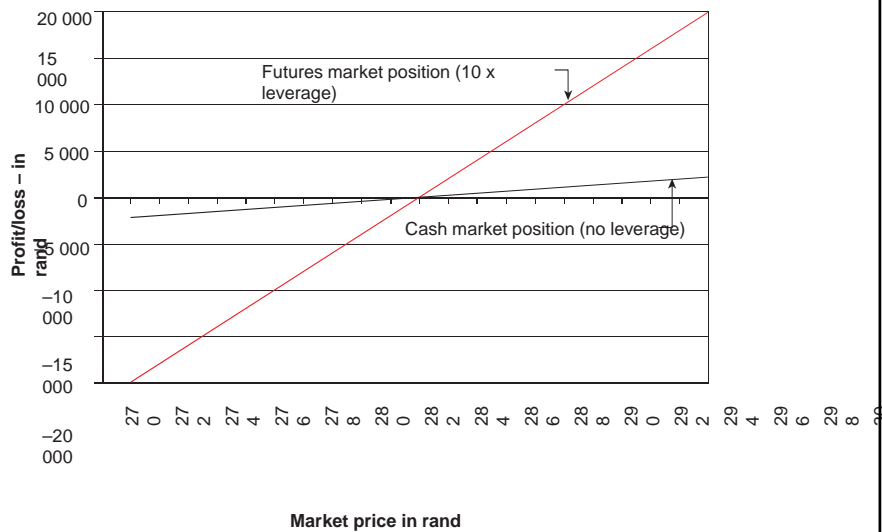


Table 13.5 Use and effect of leverage (Textbook page 417) © VAN SCHAİK PUBLISHERS



Participants

Hedgers

Speculators

Arbitrageurs



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Risk management of derivatives

[Table 13.6 Historic derivatives trading losses \(Textbook page 419\)](#)



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Published market information

Table 13.7 Published market information for derivatives (Textbook page 421)

Row	Contract	Spot/ volatility	Bid	Offer	M-t-M	Volume of deals	Volume of contracts	Value R000	Open interest contracts
1	Mar 14 ALSI	42 772	42 589	42 598	42 594	12 620	50 919	21 623 207	142 732
2	32 000 C	32,11			105 940	0	0	0	1 000
3	33 400 C	29,89			91 942	0	0	0	18
4	35 000 C	27,44			75 948	0	0	0	1 000
5	32 000 P	32,11			5	0	0	0	2 180
6	33 500 P	29,74			2	0	0	0	945
7	35 000 P	27,44			8	0	0	0	5 630
8	Jun 14 ALSI	42 772	42 874	42 998	42 936	1	77	32 879	18 095
9	Sep 14 ALSI	42 772	42 959	43 168	43 064	6	5 000	2 143 250	6 759
10	Dec 14 ALSI	42 772	43 469	43 588	43 529	0	0	0	14 311

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