

# *ribs SC&I | DB&C*

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# Insuring Space Activities

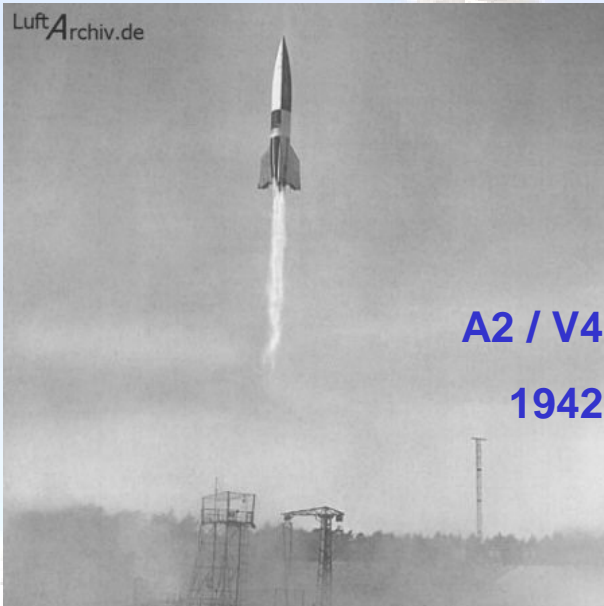
A risky business



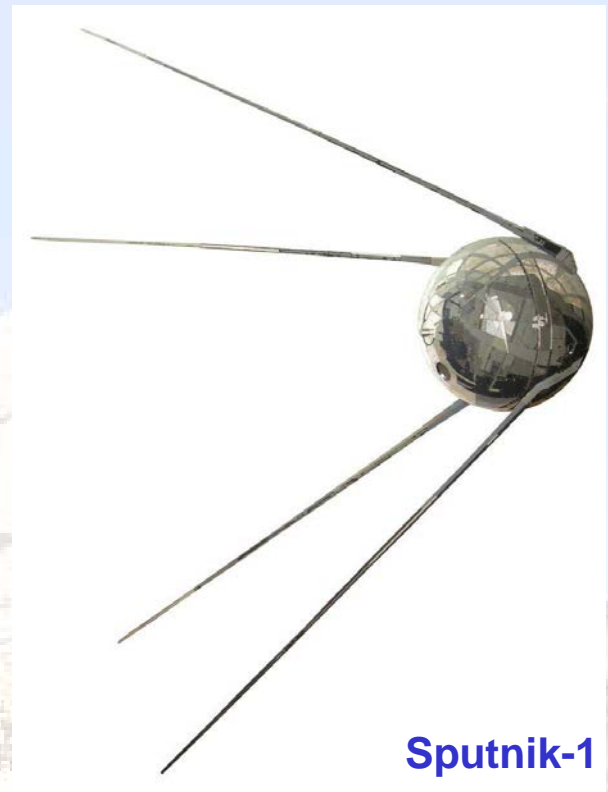
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# History-1



A2 / V4  
1942

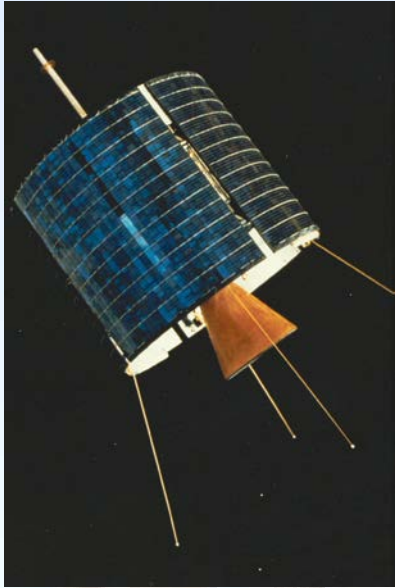


Sputnik-1



R 7 / SL-1  
4 Oct 1957

# History-2



## Early Bird / Intelsat-1

240 telephone or 1 TV channel

5 million USD pre-launch

25 million USD third party liability

DELTA, April 1965



## ANIK C3 en SBS C

First commercial space insurance combined with NASA controlled manned space operations

STS-5, Nov 1982



# Rescue of Westar VI in November 1984







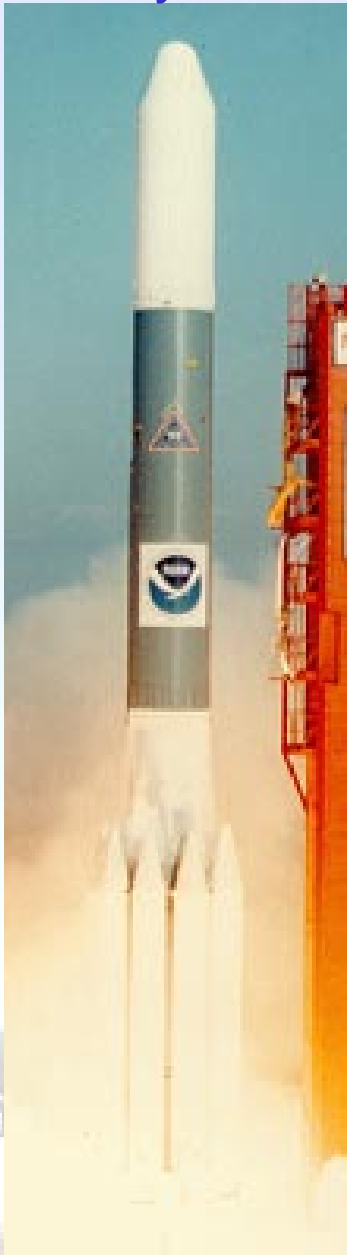




# History-4b



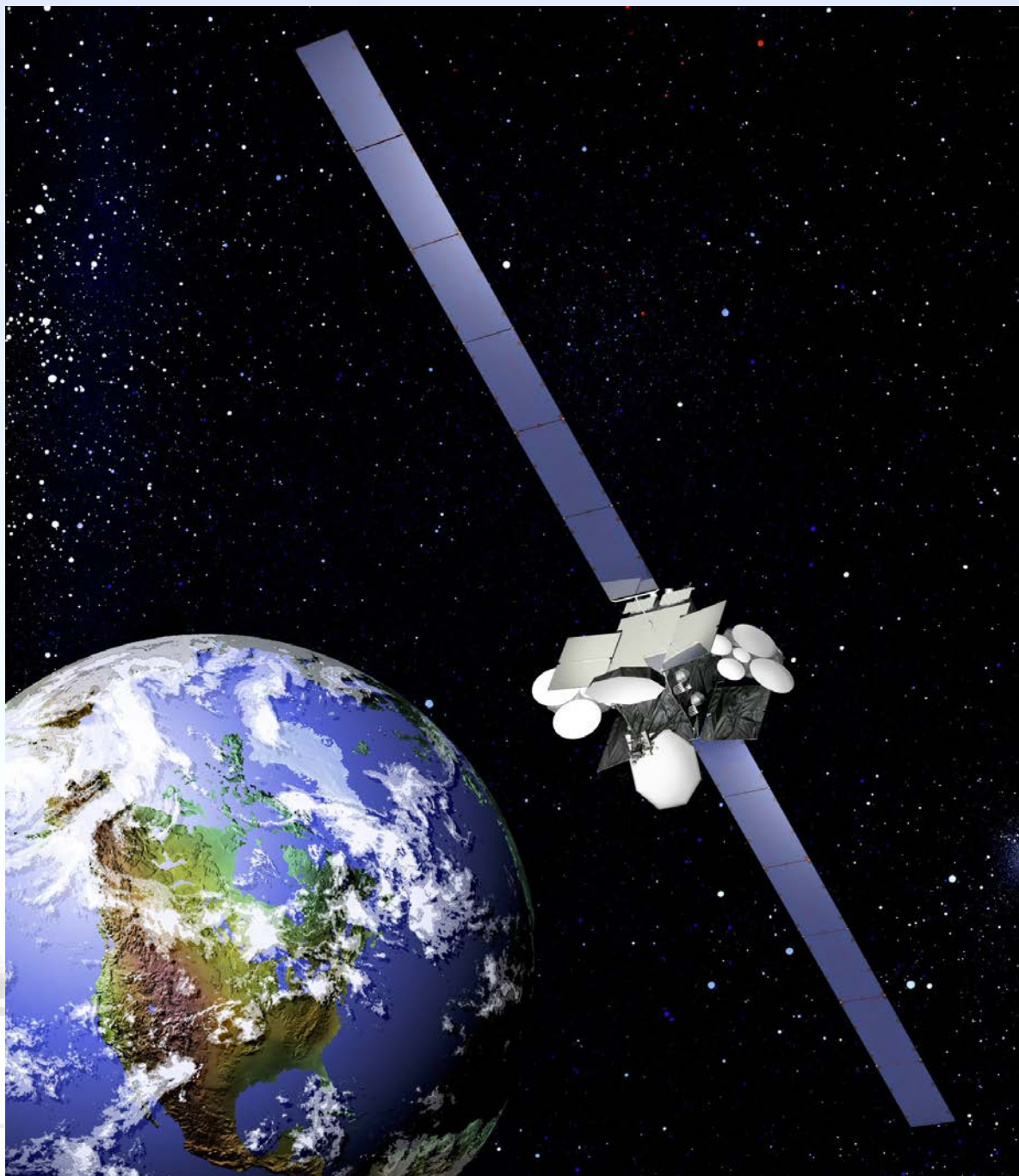
# History-4c



# History-5



BSS 702 Comsat



## The players

Satellite/Launch Vehicle Owners

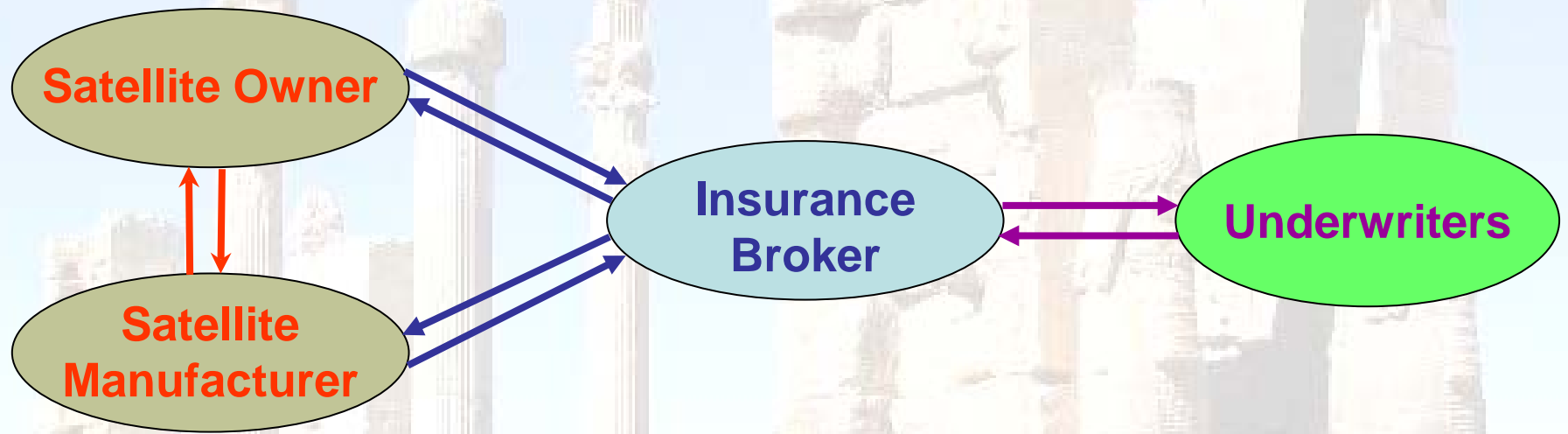
Satellite/Launch Vehicle Manufacturers

Insurance Brokers

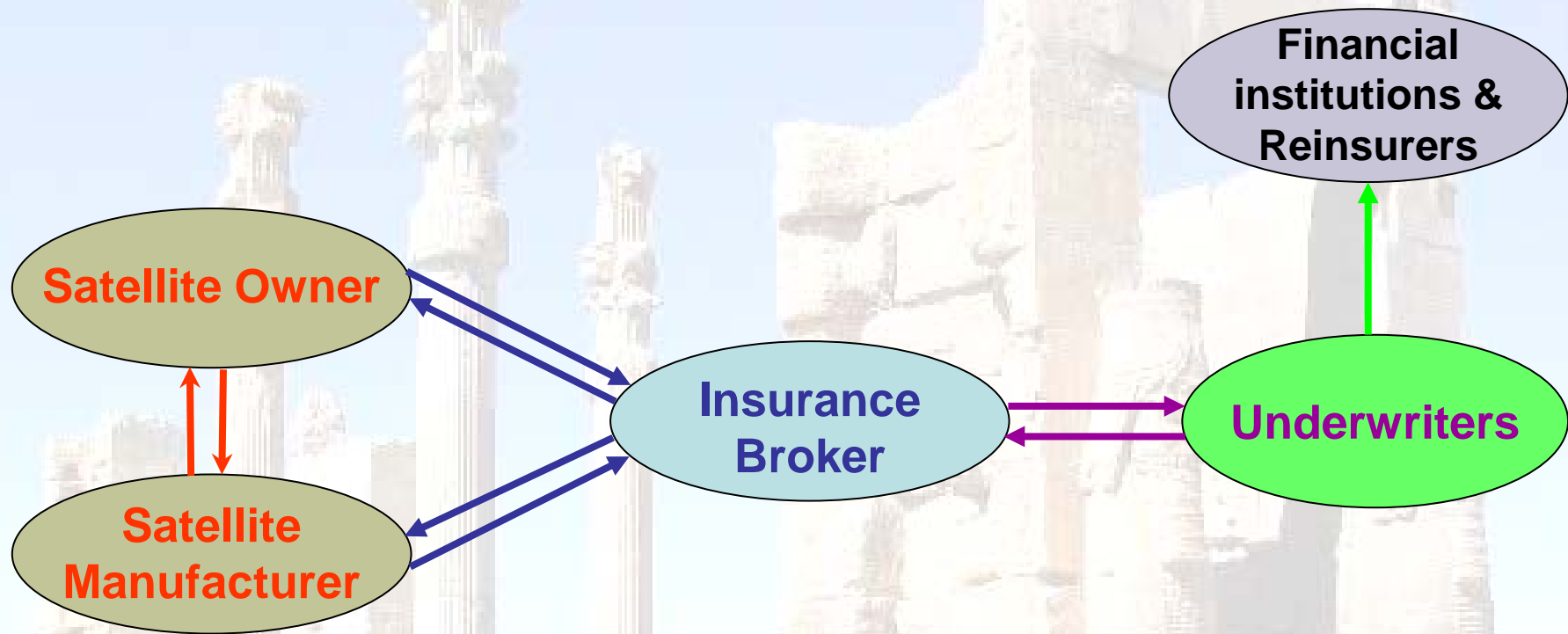
Underwriters

Financial Institutions & Reinsurers

# The Underwriting Process-2

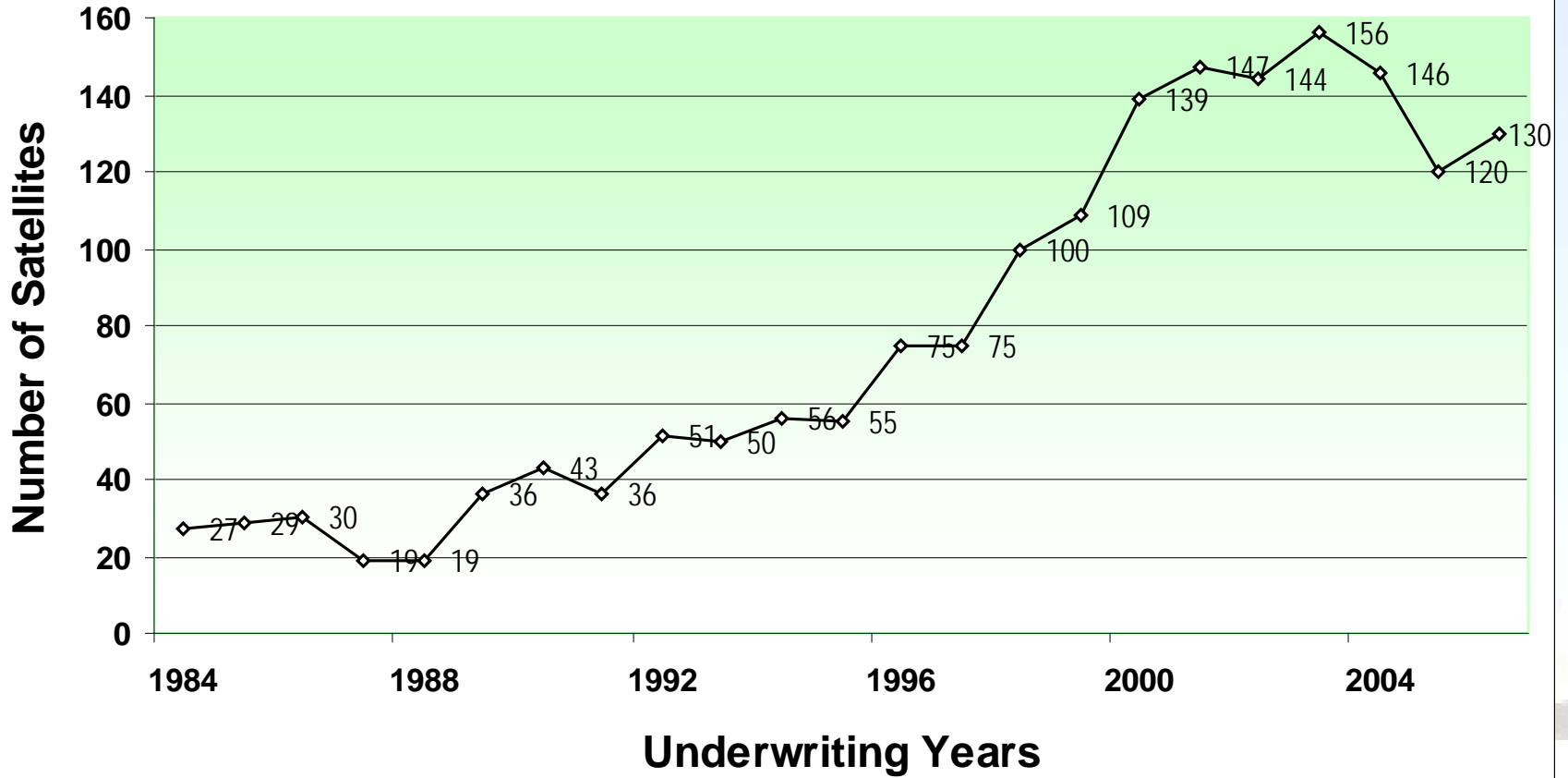


# The Underwriting Process-2



# The Underwriting Process-3

## Insured Satellites In-orbit





Space Launch Vehicle



Satellite



Third Party Liability



Space Flight Related Equipment



### Pre-launch Insurance

Pre-launch insurance provides all-risks cover for material damage to the launch vehicle and / or the satellite during the period of time between departure from the integration facility (arriving at the launch site) and the intentional ignition of the first stage of the launch vehicle.

Pre-launch cover generally ends when ownership passes from the manufacturer to the purchaser.

The transfer of title is contained in the satellite procurement contract and precisely described in the policy and varies per launch vehicle (e.g. intentional ignition, launch, retaining clamps released, lift-off, etc.).

## Launch Insurance (1)

The launch risk phase generally starts at lift-off but can, alternatively, start when the first stage engines are intentionally ignited.

In the latter case, an aborted launch is also covered and ends when the satellites are totally separated from the launch vehicle and in-orbit testing has been completed. *Nowadays a longer period of cover, usually up to 365 days after launch, is possible.*

Total loss of a satellite is declared when the satellite has been physically destroyed or cannot fulfil its planned operations due to failure to reach its intended orbit.

## Launch Insurance (2)

A partial loss is declared when the satellite can only partially fulfil its planned operations or when its operational life is shortened.

The sum insured will be paid out only in relation to the decrease in value which will be dependent upon the scale of the failure. *The policy will contain formulae to calculate the resultant decreases in value associated with the various potential malfunctions.*

Launch insurance is the most expensive type of cover.

## In-orbit Insurance

In-orbit insurance covers all risks of partial, or total, loss of a satellite during its commercial operational life period. Such cover may begin as soon as in-orbit commissioning is confirmed.

The sum insured covers the total cost of manufacture and launch of a replacement satellite, but the figure is reduced over time to avoid over-insurance.

Usually in-orbit insurance policies are written for a period of twelve months at a time and could be renewed depending on the technical condition of the satellite. Alternatively, these policies are completely rewritten if the satellite's condition or performance warrants this action.

### Transponders Insurance

This insurance provides protection against the loss of one or more communication transponders.

This type of insurance is bought by operators who do not own a satellite but purchase, lease or rent spare capacity on satellite transponders on an existing satellite.

Insurance of this type needs assessments on the condition of the satellite and on service protection relating to the specific conditions when the policy holder would be entitled to a replacement transponder.

## Loss of Revenue Insurance

Loss of revenue cover operates on an indemnity basis and is due following the partial or total failure of the insured commercial payload.

Financial loss caused by the failure could be far greater than the material damage itself.

There is no standard form of cover for these insurances, but in general indemnification only takes place when it can be definitively proven that the revenue would have been earned if the failure had not taken place.

### Third Party Liability Insurance (1)

Third-party losses caused by the launching and operating of launch vehicles and satellites constitute special risks that are excluded from the scope of cover granted under general liability insurance policies.

The purpose of this insurance is to cover all third-party legal liability claims arising from damage caused by a satellite, its launch vehicle, or any part thereof, regardless of the party against whom such claims were made.

The policy includes, as co-insured, all those parties that might conceivably be liable, in particular the manufacturer, the operator, the Launching State, and all organisations rendering services in the launch and operating phases.



## Third Party Liability Insurance (2)

For States who have ratified

*“The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, 1967”*

and/or

*“The Convention on the International Liability for Damage Caused by Space Objects, 1972”*,

third-party liability insurance is usually a requirement prior to the granting of a license for a space launch.

# Insurance Cover-10

## Insuring Commercial Human Spaceflight

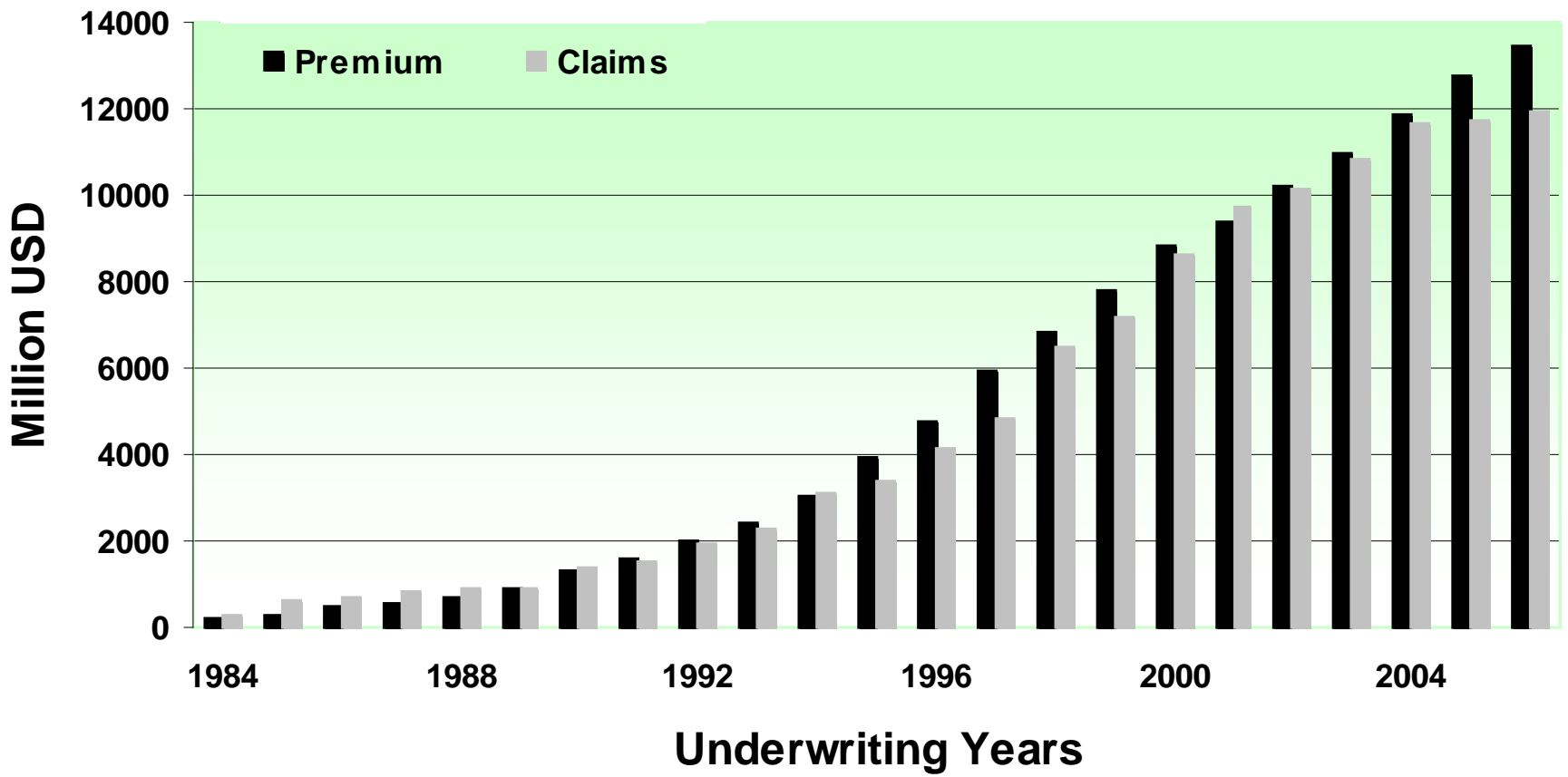


# Space Insurance Market-1



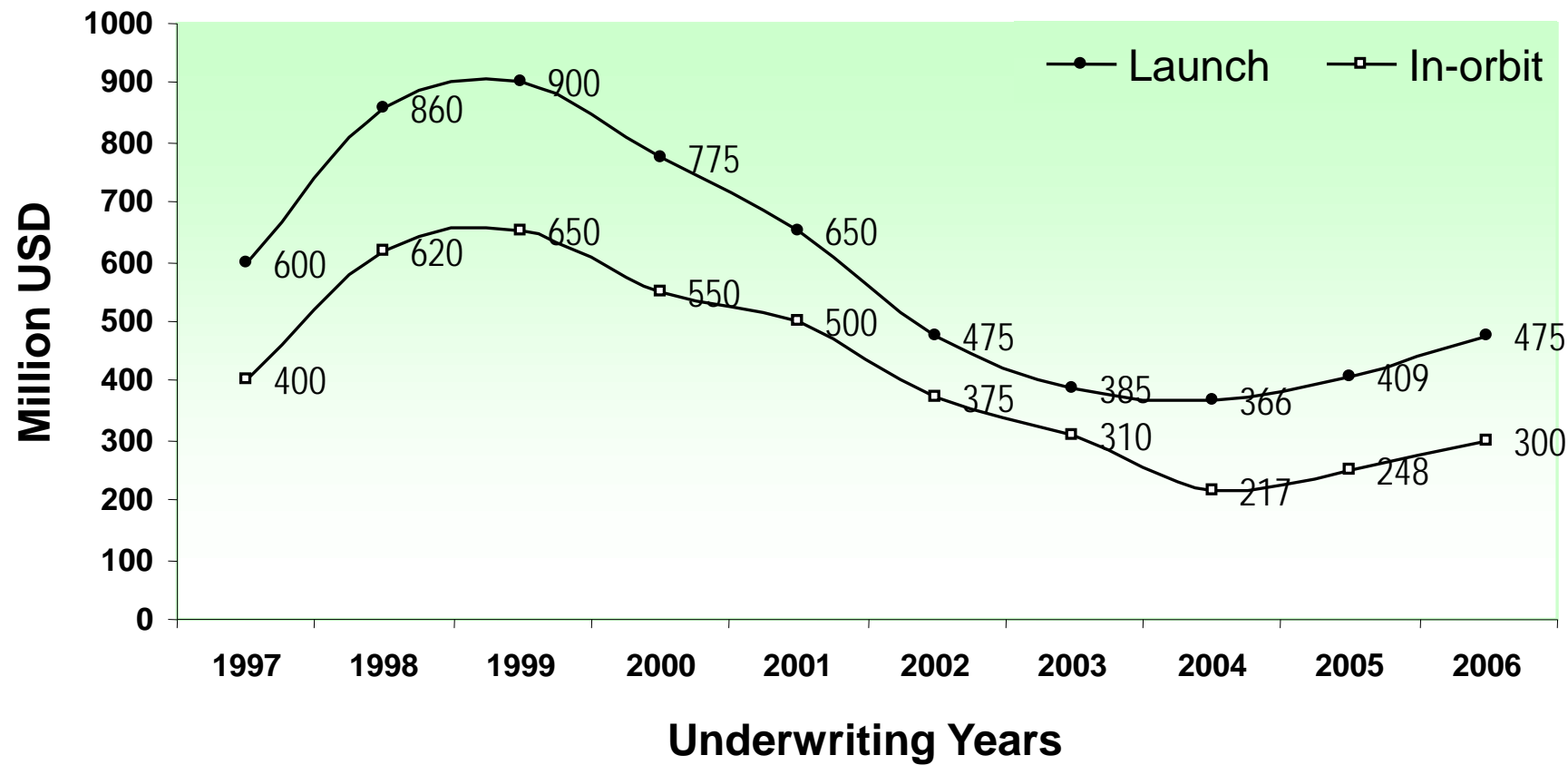
Lloyd's of London Insurance Market

## Cumulative results of the world space insurance market

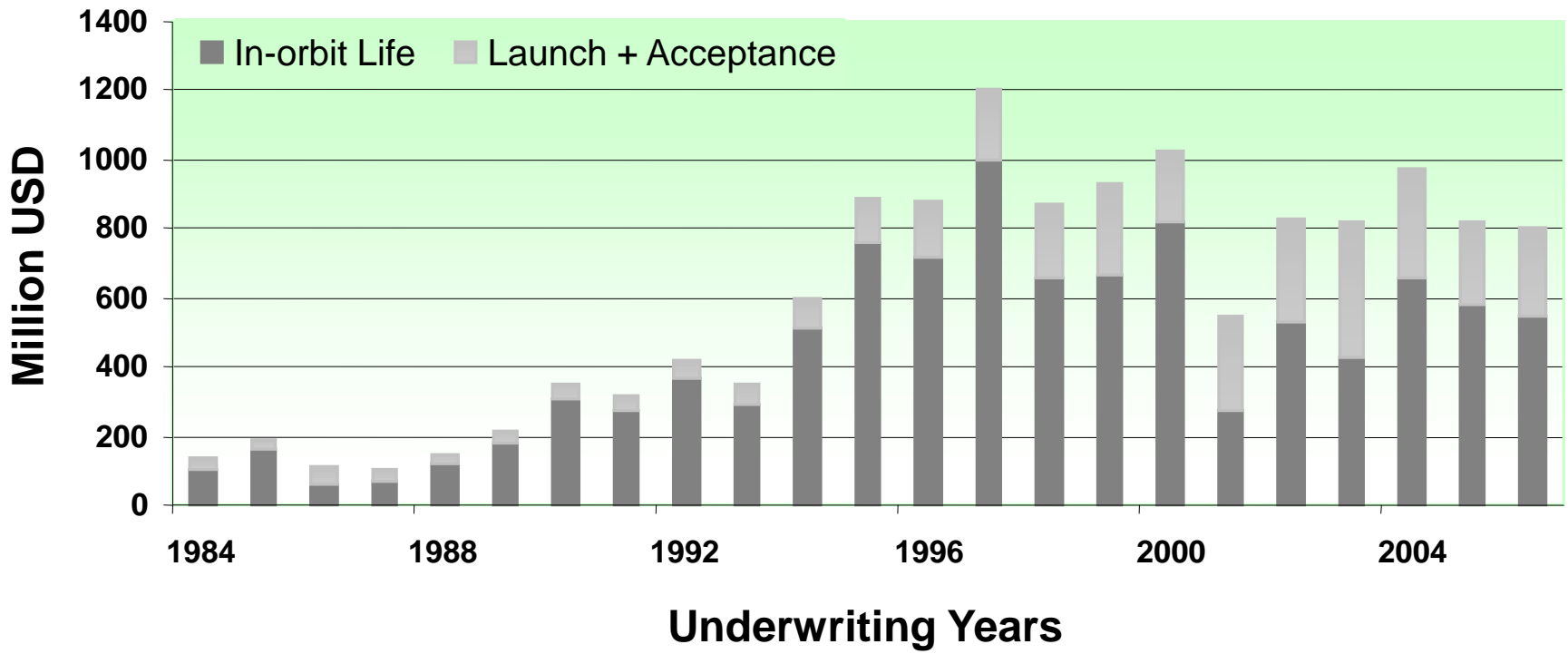


# Space Insurance Market-3

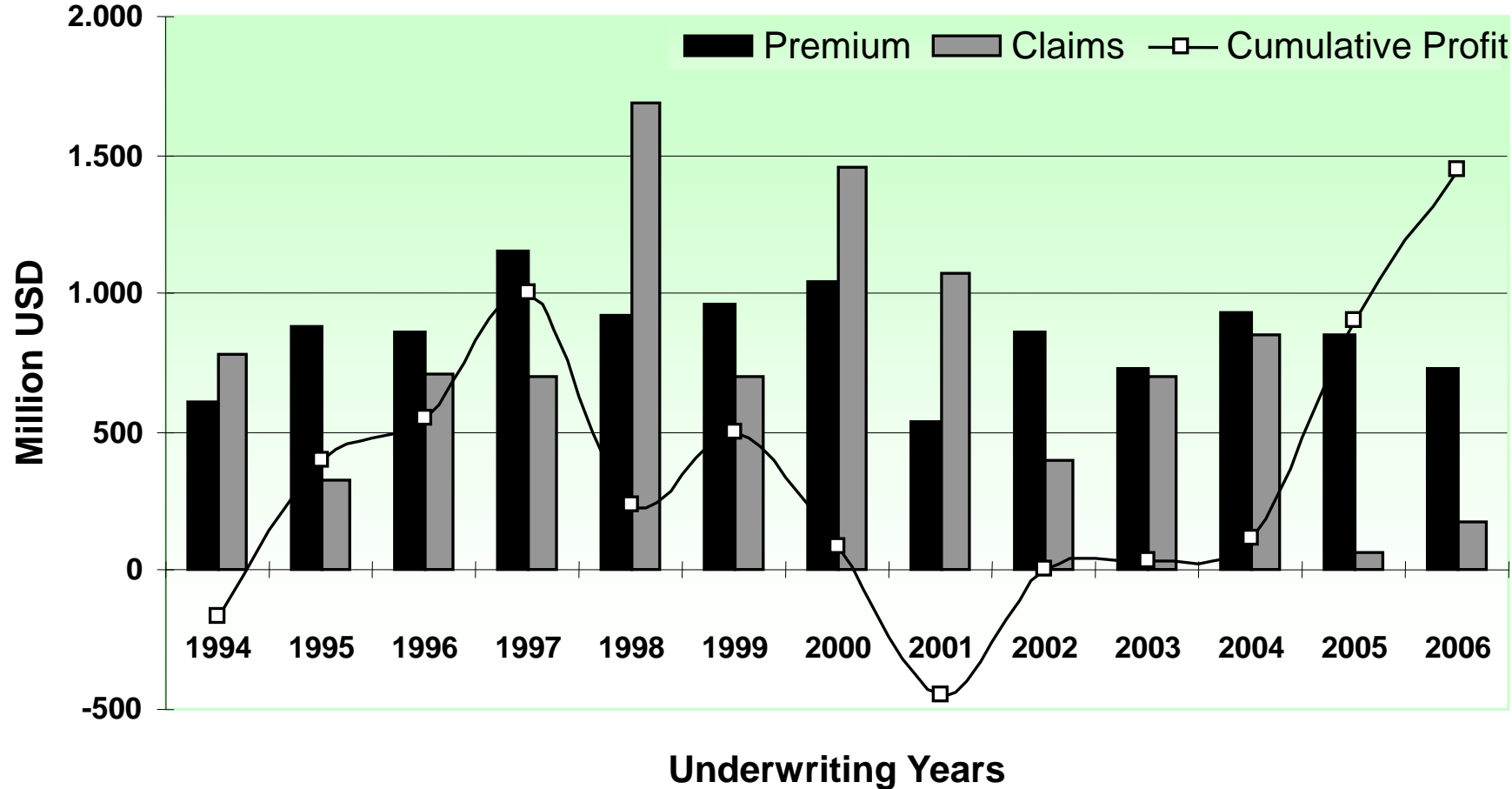
## Market Capacity



## Division between Premium Incomes

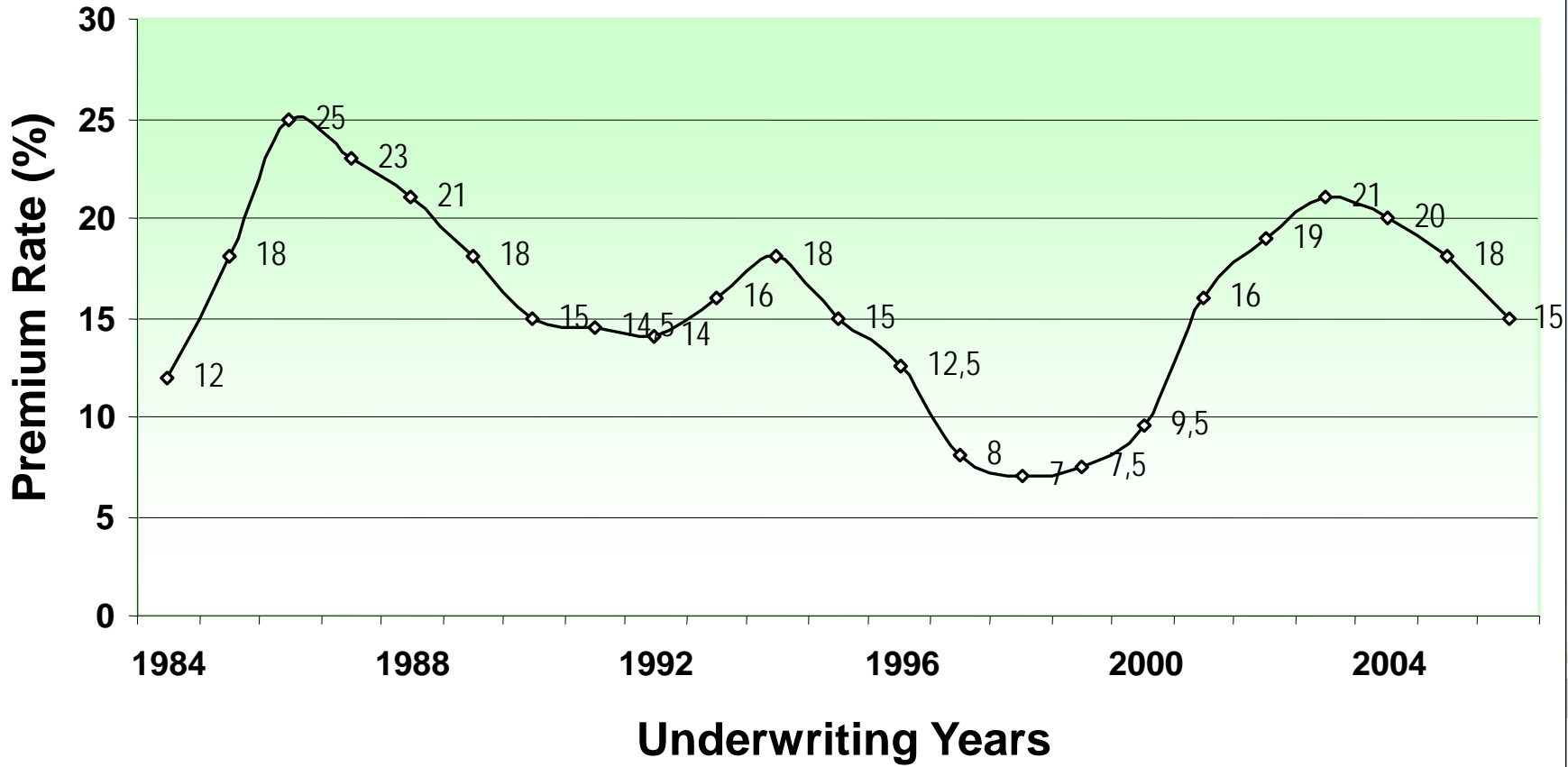


## The evolution of Premiums, Claims and Cumulative Profits



## Average L+1 Premium Rate

All rates brought into conformance of L+1 for comparison reasons

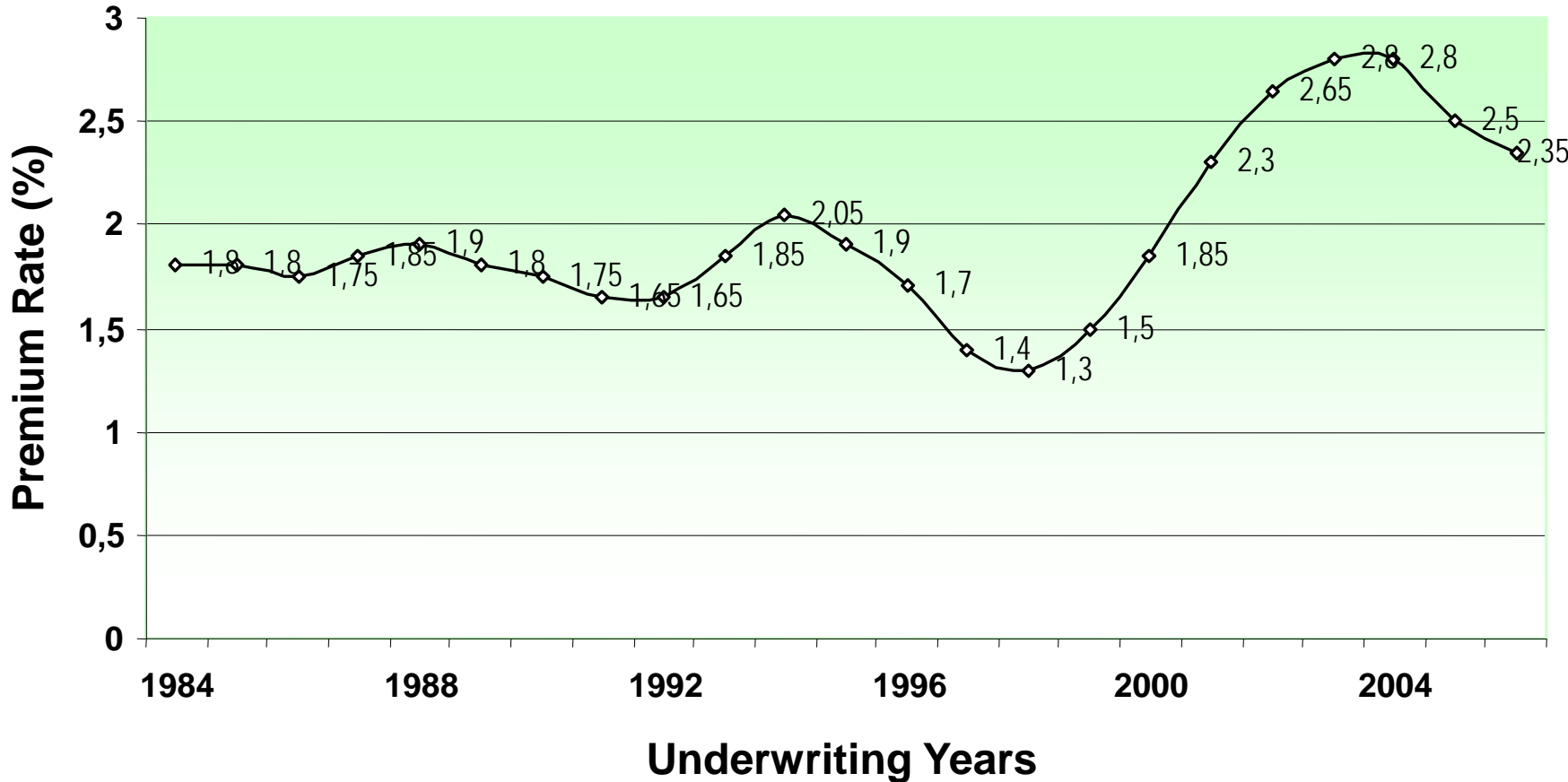




# Space Insurance Market-7

## Average 12 month-in-orbit Premium Rate

All rates brought into conformance of L+1 for comparison reasons



## Concluding Remarks-1

From 2002 on, increased premiums and few claims resulted in a launch insurance net profit. Data from 2005 and 2006 indicates that the insurance market is softening again as industry profits broke through the ever declining insurance capacity and attracted new underwriter investments.

## Concluding Remarks-2

Further increases in insurance capacity are anticipated, but these will probably be modest. It is assessed that the net profit trend experienced since 2002 may continue in the near future. Consequently, high premium rates will continue to attract more underwriter investments and so increase the market capacity further into the green zone. However, the space insurance market still has no broad base to fall back on. One or two major failures and subsequent high pay-outs could easily consume the profits that have been built up by underwriters.

# Acknowledgements

I like to thank for their valuable contributions:

Münchener Rückversicherungs-Gesellschaft of Munich

Willis Space Insurance of London

The background of the slide features a photograph of ancient stone ruins. On the left, there are several tall, fluted columns with decorative capitals. To the right, a large, partially ruined archway or gateway structure stands prominently. The sky is a clear, bright blue. The overall scene is well-lit, suggesting a sunny day.

Questions ?

A futuristic landscape under a dramatic, orange and yellow sunset sky. In the foreground, a large, dark, rectangular monolith stands on a rocky, uneven terrain. In the mid-ground, a hovering vehicle or structure is visible, emitting a bright light. The background features rolling hills and mountains, all bathed in the warm glow of the setting sun.

Choice, not chance, determines destiny.