



# How to Value an Exploration Project

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# Overview

- 1/ Why do we need Valuations ?
- 2/ How should the Valuation be done ?  
**Recommend using a standardised approach.**  
**In Australia we use the *Valmin* Code of Practice**
- 3/ Recent Trends in the Valuation of Exploration Projects in Australia  
**Examples of the types of valuations used for projects**
- 4/ Important Valuation Issues for Foreign Companies working in China  
**Suggestions on how to improve the value of your exploration project**



# 1/ Why do we need Valuations ?

**Valuations are important because they :**

- **Are used to determine the sale price of an exploration project**
- **Set the relative contributions for each of the partners in a Joint Venture project**
- **Help confirm that a proposed exploration project is of value (ie that the benefits exceed the cost of doing the exploration)**



# The importance of Using a Standardised System for Valuations

**Advantages to China from using an internationally accepted valuation system are it :**

- **Improves the confidence in the numbers generated are reliable**
- **Encourages foreign investment in the industry**
- **Enables Chinese companies to work overseas**



# International Valuation Approaches

- **United States** : Uses the Uniform Standards of Professional Appraisal (*USPAP*) ... mainly designed for valuing Real Estate, not mineral projects
- **Australia** : *VALMIN* Code, was developed by the Australasian Institute of Mining and Metallurgy in 1995 ... is presently the only valuation standard in the world specifically designed for mineral assets
- **Canada** : Canadian Institute of Mining will release its *CIMVal* in 2003 (it is largely based on the *VALMIN* Code)
- **South Africa** : South African Institute of Mining and Metallurgy is currently developing *SAMVAL*. It is based on elements of *VALMIN* and *CIMVal*



# VALMIN Code

**VALMIN Code provides general rules on the :**

- **Purpose and type of reports to be produced**
- **Qualifications required for the valuer**
- **Preferred valuation methodologies used**
- **Content and structure of the report**
- **Obligations of the company requesting the valuation**
- **Responsibilities of the valuer**



# Four Requirements of the *VALMIN* Code

## 1/ Transparency

- Study needs to explain how the valuation was done, and the methods and assumptions used (so that other people can replicate the results)

## 2/ Materiality

- The valuation must include all of the important information about the project

## 3/ Competence

- The valuer must have a high level of expertise in the commodity being evaluated

## 4/ Independence

- The valuer must not receive any beneficial interest in the outcome of the study
- The price set must be at “fair market value”



## 2/ How should the Valuation be done ?

- The **VALMIN Code** does not specify which valuation methodology should be used. It leaves the decision to the valuer.
  - However, the valuer must state the reasons why he chose the particular methodology used
- The choice of methodology depends on the available data and the exploration stage for the project
- Recommend using alternate methodologies
  - Use them to validate the preferred value





# Common Valuation Methodologies

## 1/ Multiples of Exploration Expenditure Method

- Value depends on how much money has been spent in the past and/or how much will be spent on the project

## 2/ Joint Venture Method

- The value is related to how much the Joint Venture partner is planning to spend on the project

## 3/ Geoscience Method (Kilburn Method)

- Involves assessing the technical factors of the project

## 4/ Comparable Market Value Method

- Value is set by what other similar projects sell for

## 5/ Income Method

- Value is calculated from the likely future cash flows generated from the project



# Multiples of Exploration Expenditure Method

**Value is determined by how much was spent on exploration in the past plus future expenditures. The total figure is adjusted by a factor related to the prospectivity of the area**

This factor is called the Prospectivity Enhancement Factor (PEM).

**note :**

- Only include those past expenditures that are reasonable and productive (ie exclude expenditures that were ineffective)
- Only count those future expenditures which are committed to the project
- Only use a high PEM if the exploration results are compelling



# Typical Adjustment Factors

Simplified Example

The Prospectivity Enhancement Multiplier( PEM) can range from 0 to 5 but is usually in the range 0.5 to 3 .0 . The average is ~1.8

## Multiplier

<b>x0.5</b>	Previous exploration indicates that the area has limited potential for a major discovery
<b>x1.0</b>	Existing data is sufficient to warrant further exploration
<b>x1.5</b>	Have direct evidence of an interesting target. Further work is warranted to evaluate the target
<b>x2.0</b>	The leases contain a defined drill target with significant geochemical intersections
<b>x2.5</b>	Exploration is well advanced and limited in-fill drilling is likely to define a resource
<b>x3.0</b>	Have already found a substantial resource (that is likely to lead to a mine). Further exploration is likely to lead to an increase in the size and quality of the resource



# Joint Venture Method

**Value is directly related to how much the Joint Venture partner will spend on exploration to earn his interest in the project.**

$$\begin{array}{l} \text{Value of 100\%} \\ \text{of Project} \end{array} = \frac{(\text{Exploration Expenditures})}{(\text{Equity share for JV Partner})}$$

*and ...*

$$\begin{array}{l} \text{Remaining Value} \\ \text{to Original Owner} \end{array} = (\text{Value of 100\% of Project}) \times (\text{Owner's Equity Share})$$

**Note : Need to adjust the value for delay in when the money is spent (time-value-of-money) as well as the likelihood that the JV partner will continue to fund the project**



# Joint Venture Method : Worked Example

Company A is prepared to spend \$2m over 4 years to earn a 60% equity share in an exploration project currently owned by Company B.

Assume 33% Probability of the project going to completion and (say) a 18% discount for delayed payments

$$\begin{array}{l} \text{Value of 100\%} \\ \text{of Project} \end{array} = (\$2\text{m}) \times 33\% \times (1-0.18) = \$0.90\text{m}$$

-----  
60%

*and ...*

$$\begin{array}{l} \text{Remaining Value} \\ \text{to Company B} \end{array} = (\$0.90\text{m}) \times 40\% = \$0.36\text{m}$$



# Geoscience Method

**Was originally developed by Kilburn in 1990 to systematically assess the physical attributes of the exploration property using a scoring system**

**The score is adjusted for local market conditions and then multiplied against a standard cost (\$ per km<sup>2</sup>) for a typical exploration project**

This value is called the Basic Acquisition Cost (BAC), and refers to the typical average cost incurred to acquire a tenement and pay all Government charges for the for next 12 months



# Kilburn Rating Criteria

Simplified Example

Rating	Off-Property Factor	On-Property Factor	Anomaly Factor	Geological Factor
<b>0.1</b>				Unfavourable Lithology
<b>0.5</b>			Extensive previous exploration gave poor results	Generally favourable Lithology on 25% of the Lease area
<b>0.9</b>				Generally favourable Lithology (50% Lease)
<b>1.0</b>	No known mineralisation in district	No known mineralisation on the leases	No Targets outlined	Generally Favourable Lithology (70% Lease)
<b>2.0</b>	Several old workings in district	Several old workings on the leases	Several well defined targets	Generally Favourable Lithology with structures
<b>3.5</b>	Historic production >200,000 ounces	Historic production >100,000 ounces		
<b>5.0</b>	Historic production >1 million ounces	Historic production >500,000 ounces	Several Ore Grade Drill Intersections	



# Geoscience Method : Worked Example

Company A has 220 km<sup>2</sup> of exploration leases, in a district with known historical production of 200,000oz of gold. While there are several old workings on the lease, historical production was small. Also only 50% of leases has a favourable lithology and much of the host rocks are under cover. Some drill targets have been defined

Off-Property Factor	On-Property Factor	Anomaly Factor	Geological Factor
Historic production >200,000 ounces	Several old workings on the leases	Some Targets outlined	Generally favourable Lithology on 25% of the Lease area
x3.5	x2.0	x 1.5	X 0.5

$$\text{Technical Factor} = 3.5 \times 2.0 \times 1.5 \times 0.5 = 5.25$$

$$\text{Market Factor} = 1.0$$

$$\text{Value of Leases} = 5.25 \times 1.0 \times \text{A\$335 /km}^2 \times 220 \text{ km}^2 = \$387,000$$

In Australia the BAC for an Exploration Lease is A\$335/km<sup>2</sup>





# Comparable Market Value Method

**This method uses the sales price of other other projects in the area to determine the value of the exploration project**

**There are several problems with this method :**

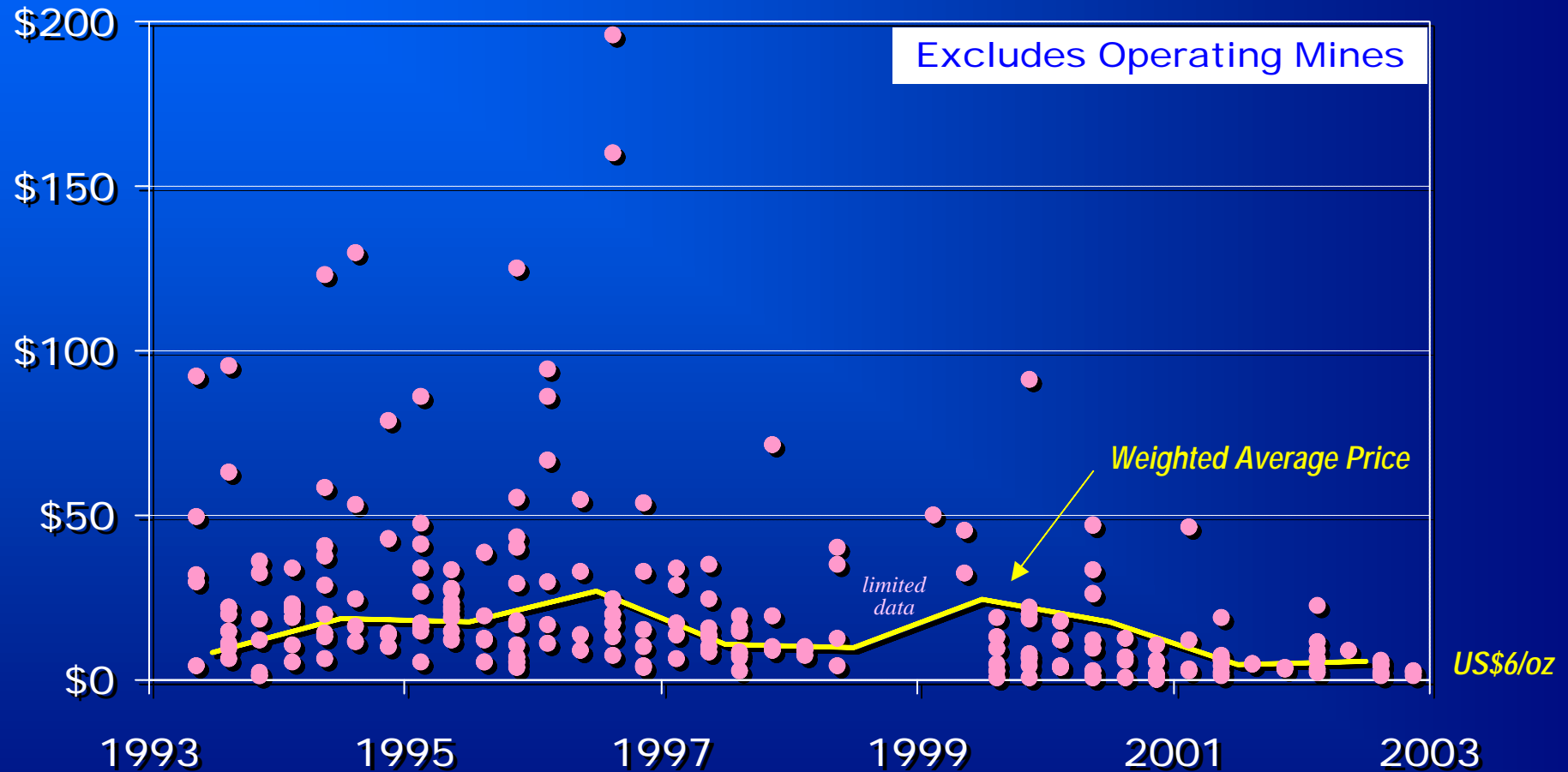
- **The mineral potential of your leases may be different**
- **Many sales do not involve cash. Instead they may be Joint Ventures or Royalties which are difficult to value**
- **The sale might not be at “arms-length” and therefore not be a fair price**

**One variation on this is the *Yardstick Method* – where the project is valued in terms of recent sales on a \$/ounce basis**



# Selling Price of various Undeveloped Gold Deposits around the World : 1993-2002

Sale Price : US\$/Ounce





# Income (or NPV) Method

**Value is based on the likely income that will be generated from the mine when it is developed**

**The cash flow is then adjusted for capital expenditures and tax payments and the resulting cash flow is discounted back to a *Net Present Value***

**Advantage : It gives a reliable and robust valuation**

**Disadvantage: Need to have defined an economic orebody. Consequently, it can only be applied to advanced-stage projects where a feasibility study has been completed**



# Other Valuation Methods

- **Rule of Thumb Method**
  - Assign an arbitrary value (  $xx\$/\text{km}^2$  )
- **Empirical Method**
  - The Valuer's "Best" Guess
- **Statistical / Probabilistic Method**
  - Assess likely size and value of prize and adjust the value for the probability of success
- **Decision Tree Analysis Method**
  - Is a variation on the Statistical Method. Uses a range of possible outcomes (from failure to a major success)



### 3/ Recent Trends in the Valuation of Exploration Projects in Australia

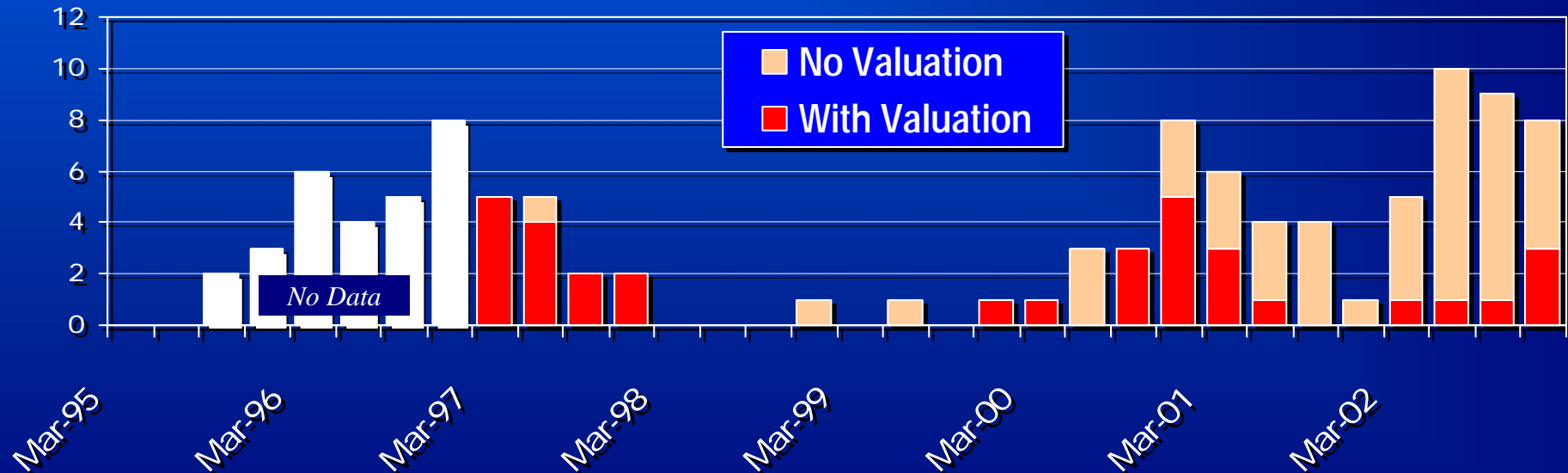
- **Australia has a large exploration and mining industry. Have ~20 qualified people working on valuing exploration projects**
- **Companies are required to use the *VALMIN* Code for transactions that involve the issue of shares on the Stock Exchange**



# Analysis

Since VALMIN was introduced in July 1995, 107 new Mineral Exploration Companies have been listed on the Australian Stock Exchange ... several of these used independent valuers to assess their exploration projects.

## Number of New Exploration Companies

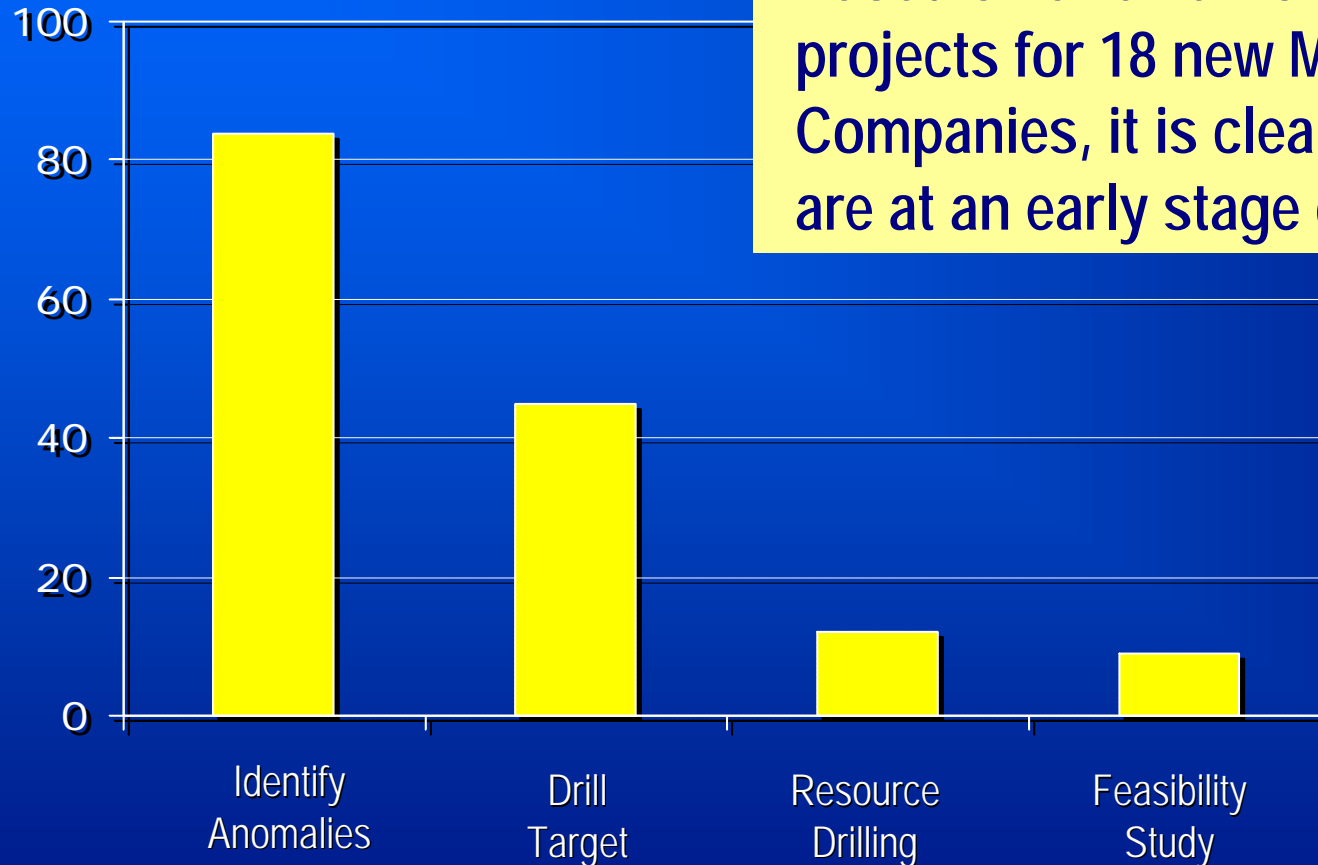


Source : ASX



# Exploration Projects

Number of Projects



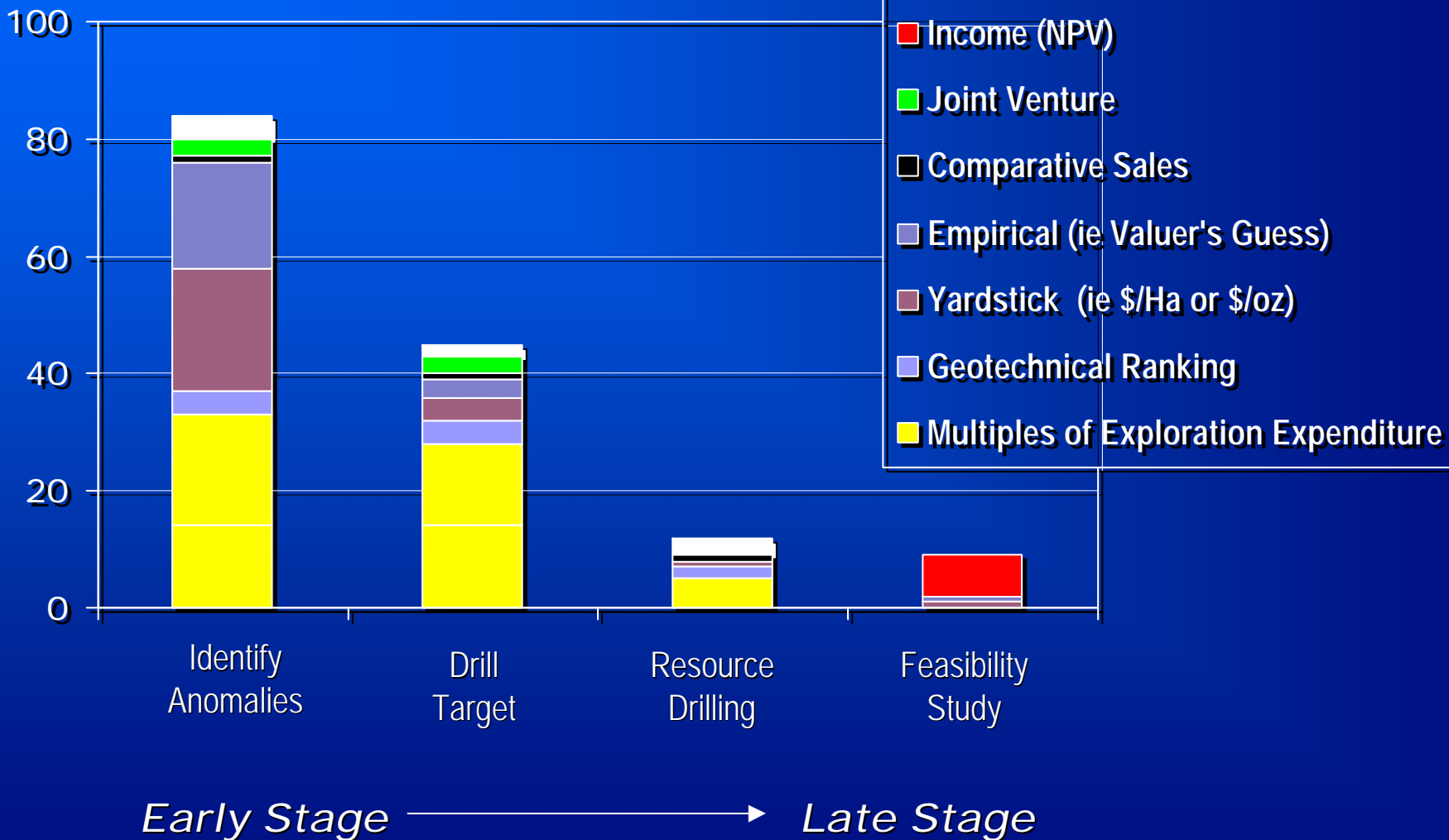
Based on a review of 150 exploration projects for 18 new Mineral Exploration Companies, it is clear that most projects are at an early stage of exploration

*Early Stage* → *Late Stage*



# Valuation Method Used

Number of Projects

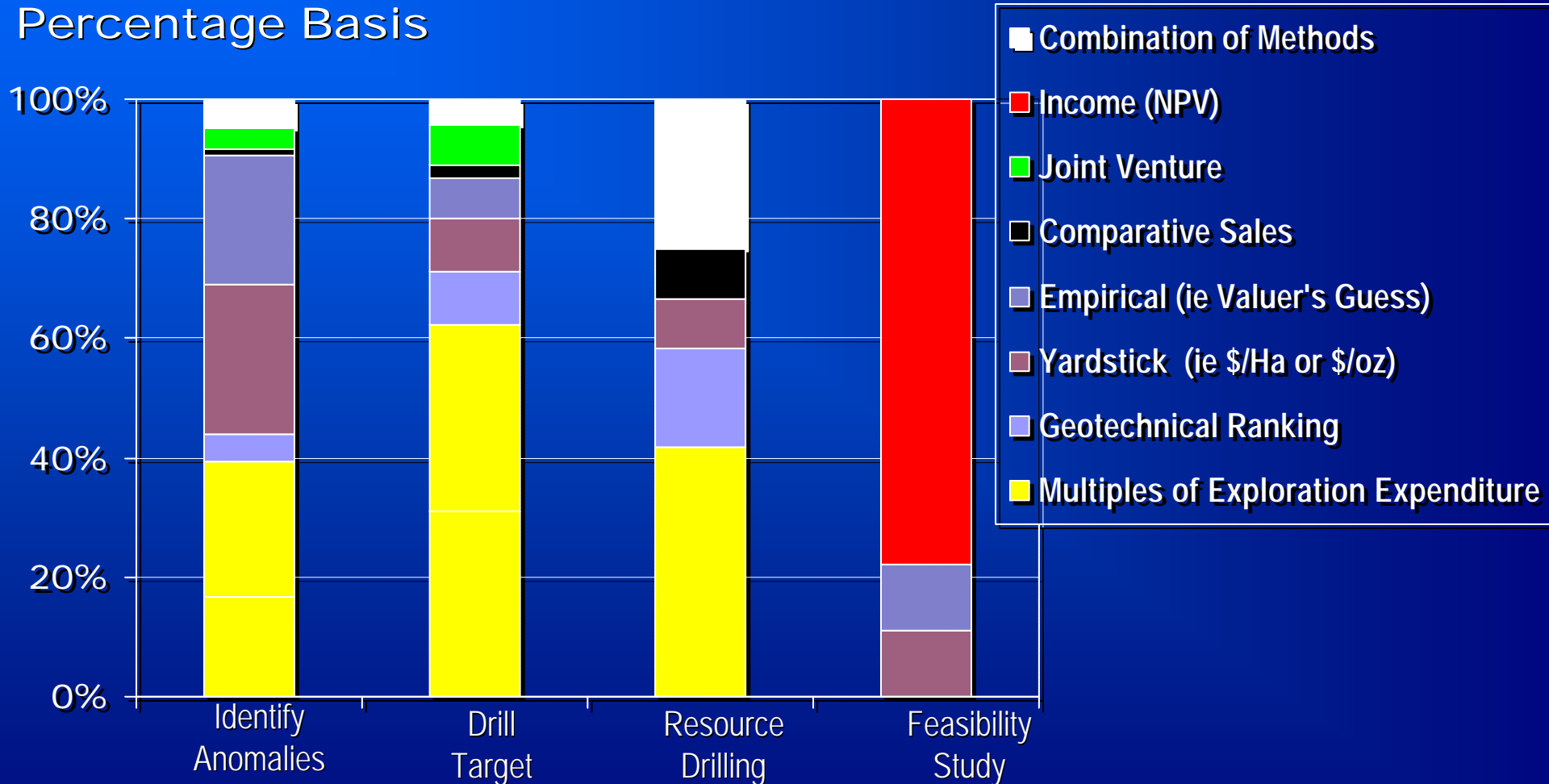






# Valuation Method Used Depends on the Stage of Exploration

Percentage Basis

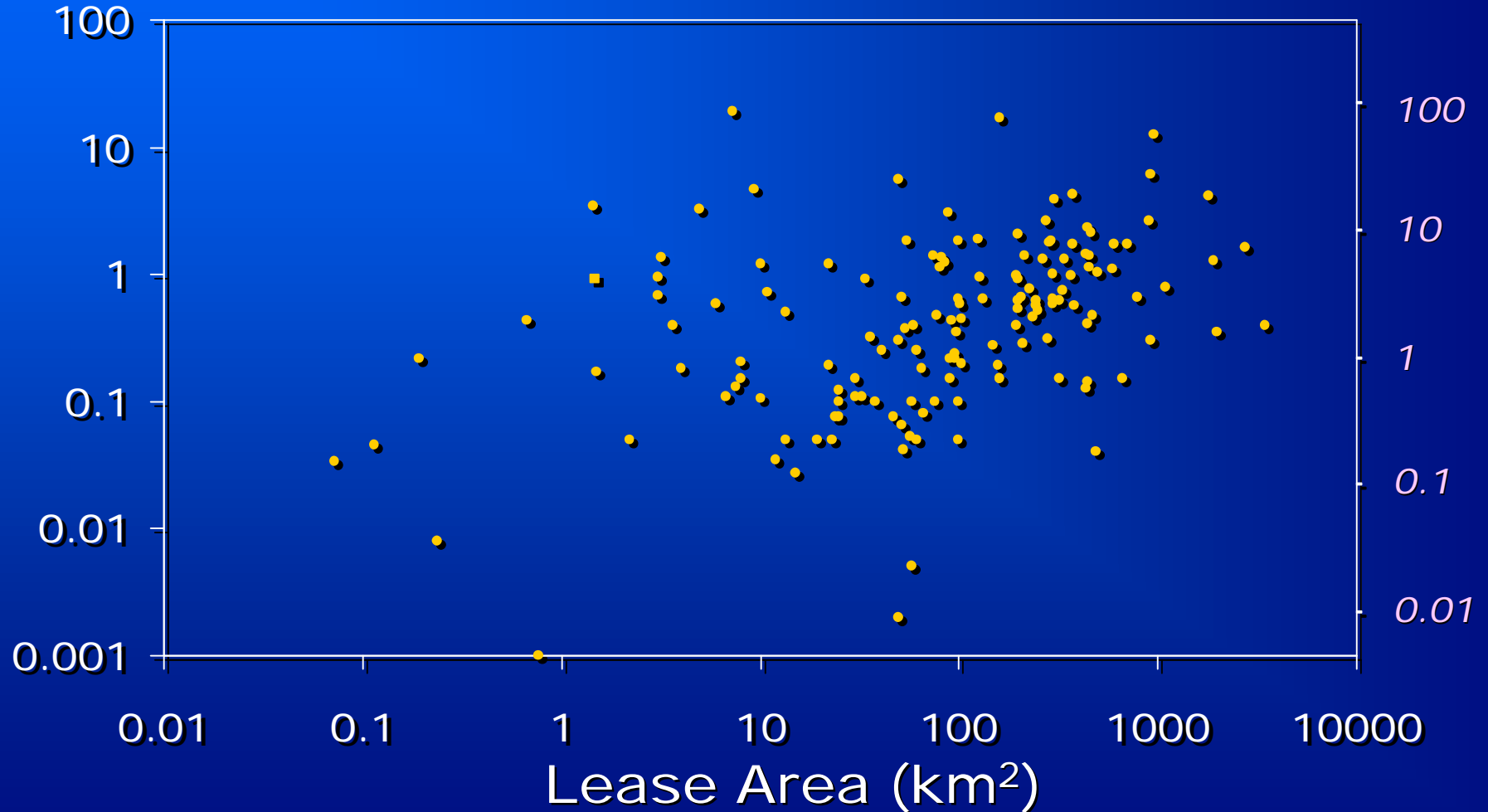




# Value varies widely with the size of the Lease area

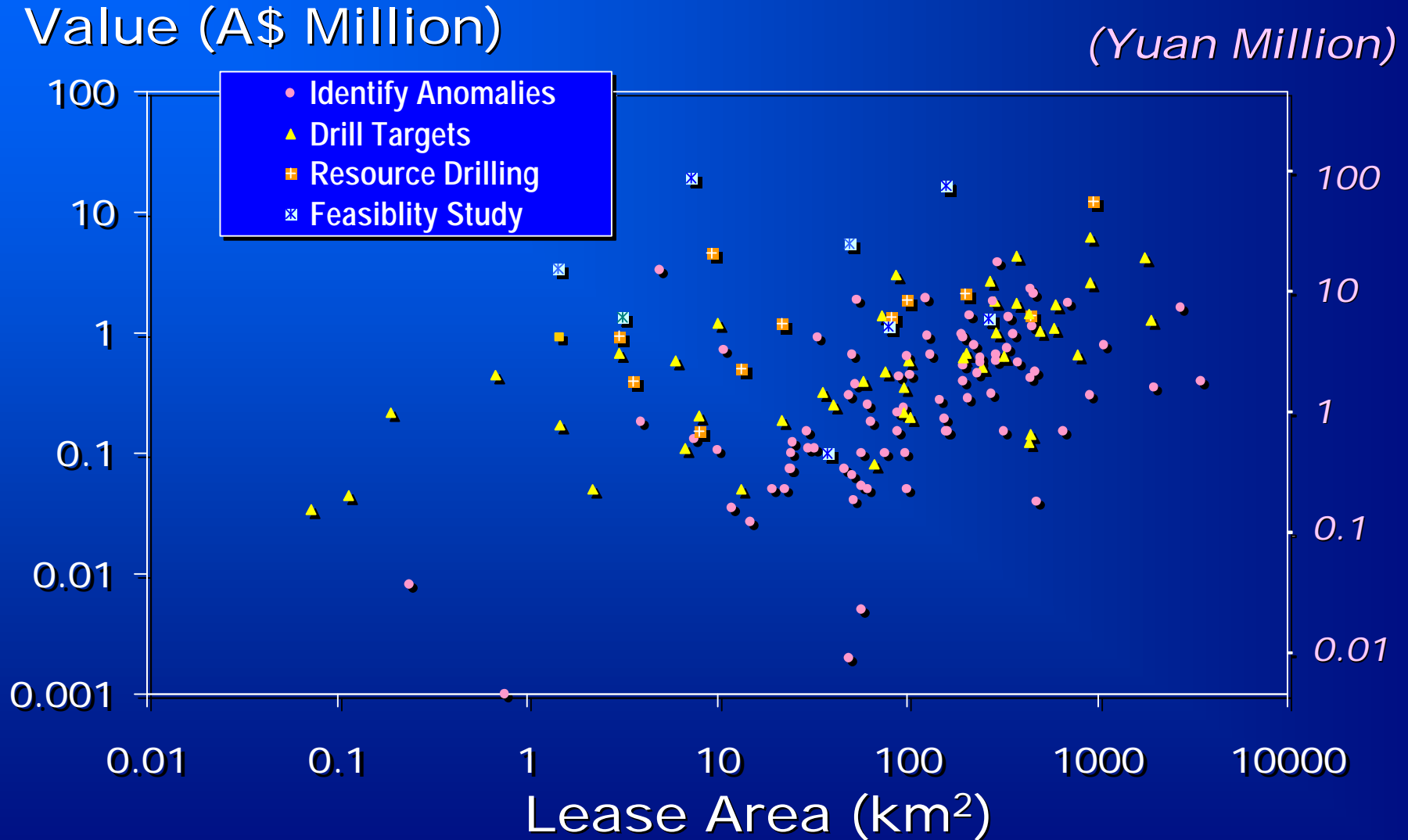
Value (A\$ Million)

(Yuan Million)



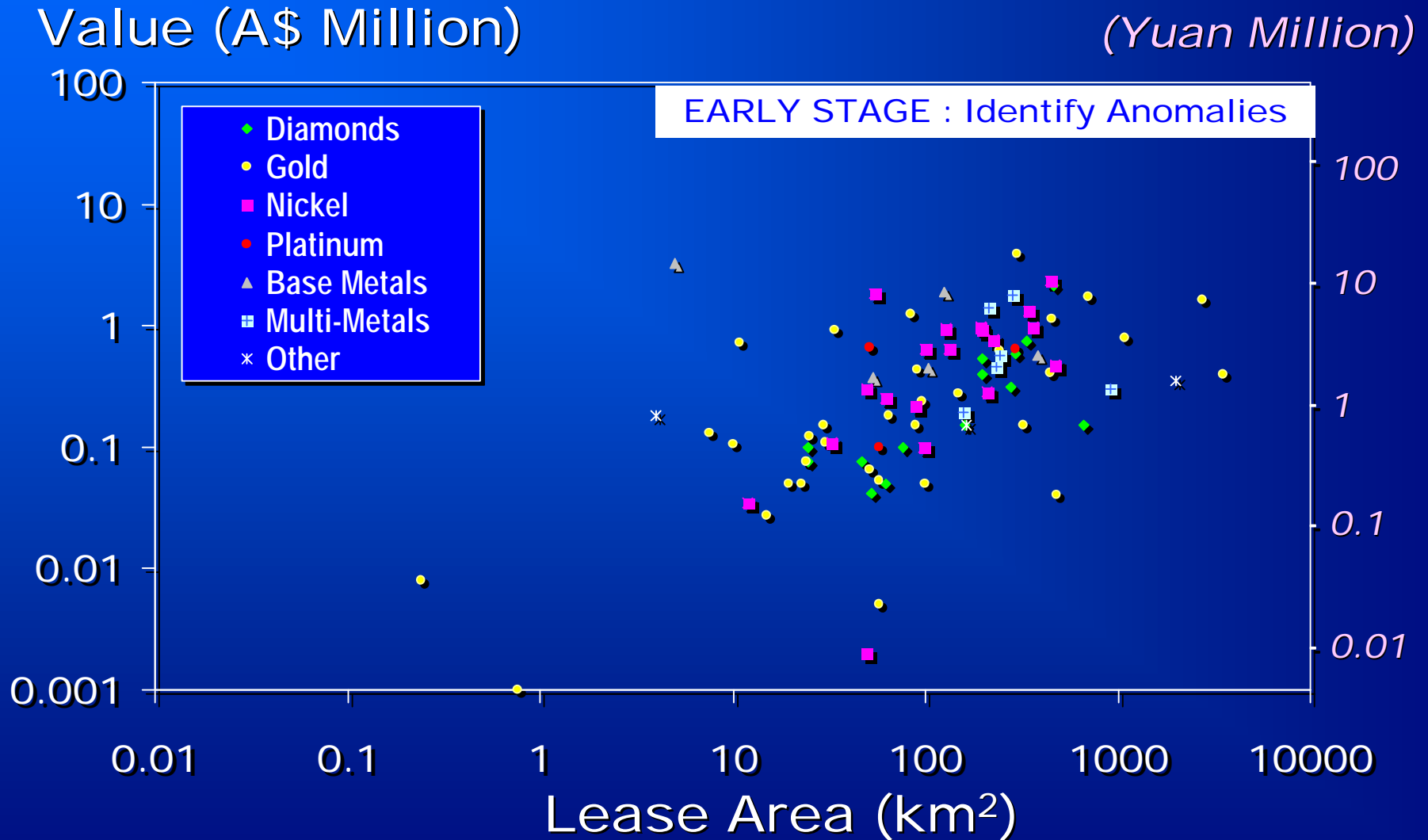


# However, Early Stage Projects tend to have Lower Values



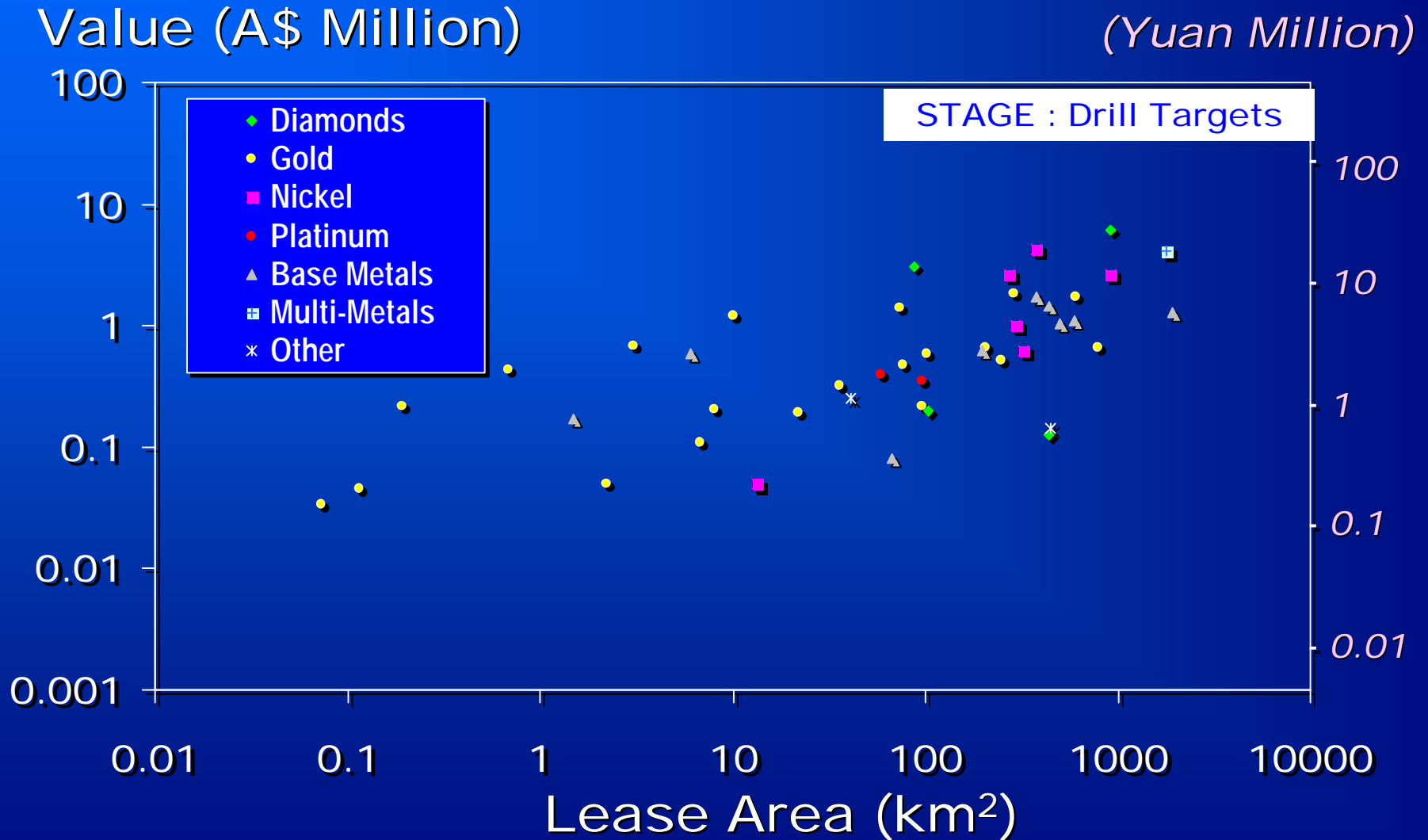


# At a Given Stage of Exploration, Different Commodities have Similar Values



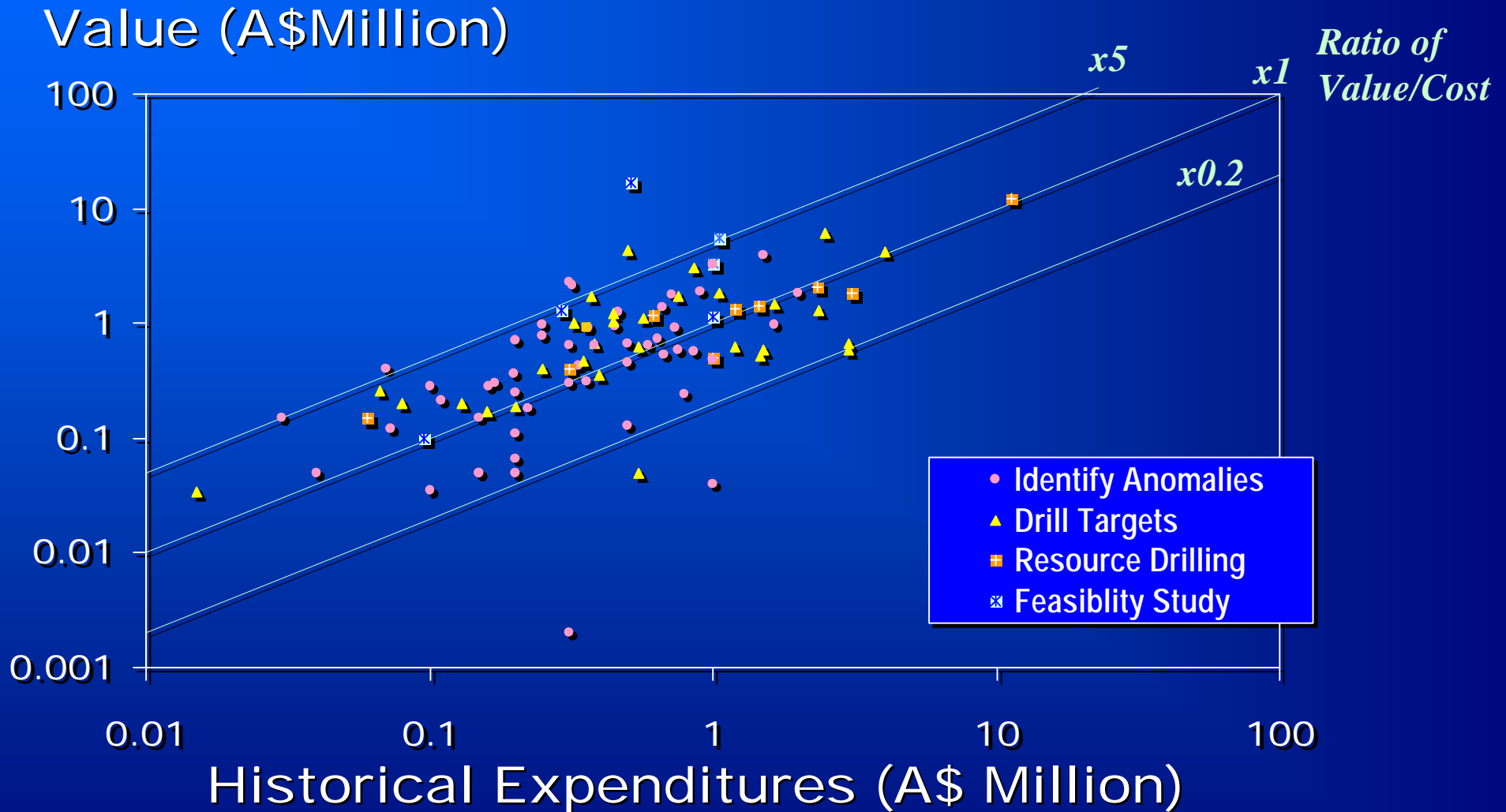


# Project Value for Various Commodities





# Value is Loosely Related to the Level of Historical Expenditures

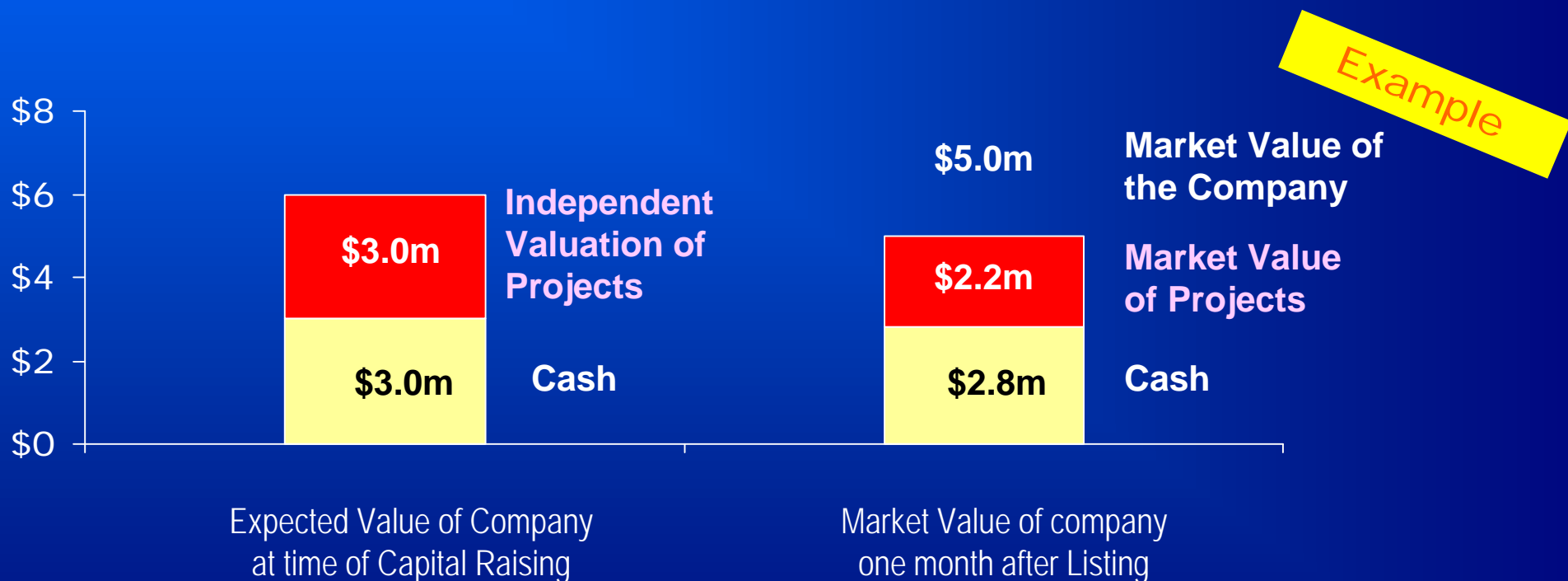


*Note : Excludes unproductive Expenditures*



# How Accurate are the Independent Valuations ?

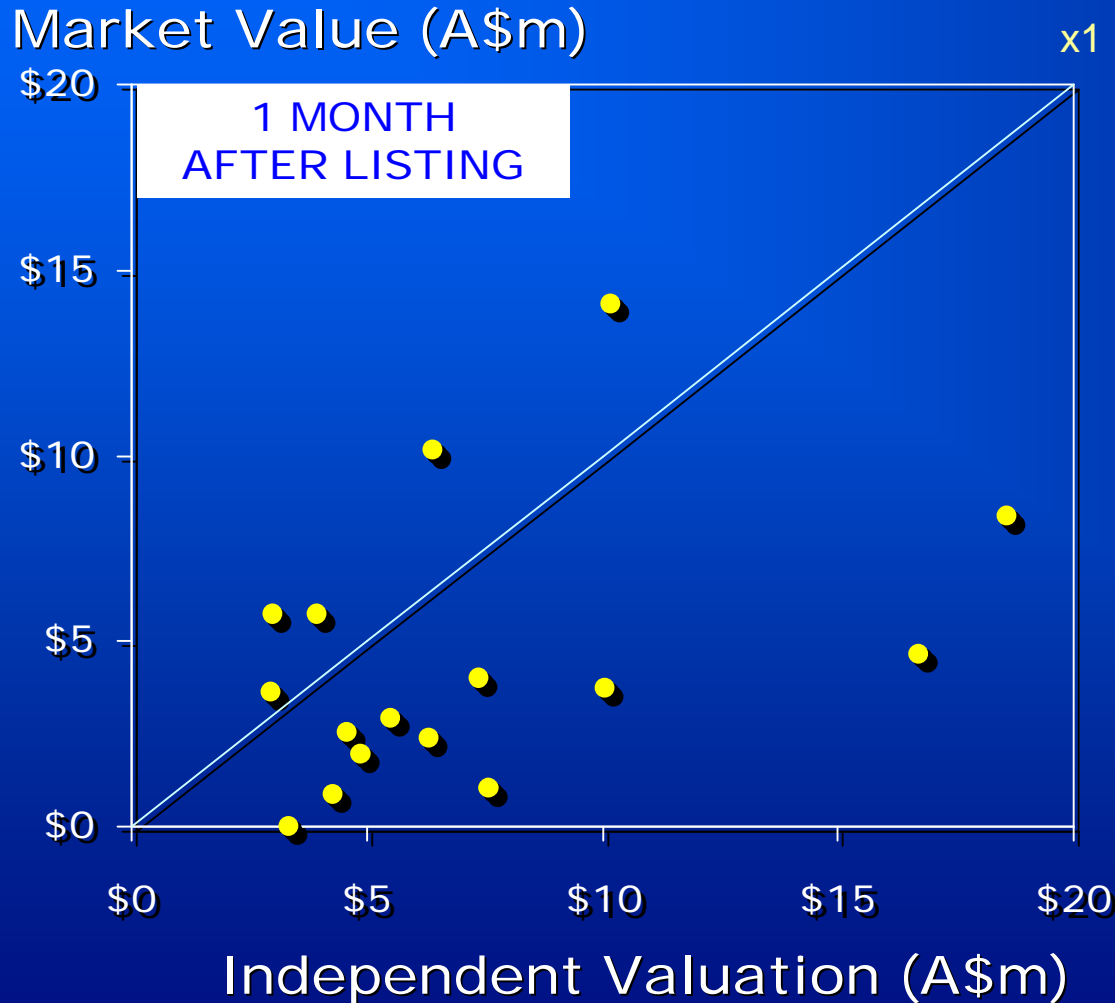
The accuracy of the Independent Valuations was assessed by comparing it against the value the Stock Market placed on the Company soon after its shares were first listed on the Stock Exchange.



$$\text{Market Value of Exploration Projects} = \text{Share Price} \times \text{Number of Shares} - \text{Cash}$$



# Independent Valuation versus Market Value



**Based on 16 newly  
listed Companies  
between 1997-2002**

**Independent Value =  
1.40x Market Value**

*Note: Each Company typically has  
4 to 10 exploration projects*





## 4/ Important Valuation Issues for Foreign Companies working in China

Foreign Companies are reluctant to put a high value on exploration projects because they :

- Have limited access to geological data to form a good view on the prospectivity
- Required to setup Joint Ventures with local Companies
- Are unfamiliar with how to do business in China
- Not familiar with the local valuation methods used

**Resolving these issues will lead to better prices for exploration projects**



# Summary

- **Must recognise that valuations are not precise**
- **To gain confidence, it is important that the industry use a standardised approach. Australia's VALMIN Code is the most comprehensive one available**
- **Which ever set of rules are used, it is critical that the methodology used is transparent, includes all relevant information, and is evaluated by experts who are independent**
- **Several valuation techniques are available. Which one to use depends on the quality of data available and what stage at the exploration project**



# Summary ....

- In Australia, early-stage projects are usually valued using the *Multiples of Exploration Expenditures* Method or the *Geoscience* Method. Advanced-stage projects are best valued using the *Income (NPV)* Method
- Benchmarking studies indicate that the Australian valuers tend to over-value projects by 40%
- Early-stage exploration projects tend to have low values. In Australia a project at the drill-testing stage is typically only worth A\$0.1 to \$1m. Similar projects in China should have an even lower value



# Conclusions

- **Most exploration projects are not worth much**
- **The low value for early-stage projects is due to the high risk nature of exploration**
- **The value is further reduced if the exploration costs are high, the JV terms are difficult or if the business risk is high**
- **The value / attractiveness of an exploration project in China can be maximised by providing high quality data on the prospectivity and by ensuring that the business rules are transparent**