

Business Models for Space Mining

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Business Case for Mining the Moon

- Prof. Sommariva provided a compelling case for the viability of mining water for propellant on the moon
- Nice discussion of two possible industry structures
 - Integrated firm
 - Explorer-Miner contract
- One of the main takeaways is that the Explorer-Miner contract structure provides more expected value

Risk buy downs

- In the SDA Bocconi's analysis, risk is managed by moving it largely to the exploration company
- This is not unlike with terrestrial miners where a junior mining company does the exploration and feasibility studies of a deposit and is then bought out by a larger mining firm
- Investors in the junior mining company know the higher risks but expect multiples in return; investors in larger mining firms know there are smaller risks and expect a positive IRR

Chicken & Egg Problems

- One market risk to the Explorer is how many buyers there will be for the final product
- In new markets like propellant in space, a chicken and egg problem can delay/inhibit investment in exploration
 - Not unlike recent experiences with electric vehicles
- While exploration is being done, markets of propellant in space can be encouraged as a way to “buy down” risk

Development Finance Institution

- Similar to entities like the Overseas Private Investment Corporation
- Helps by providing loan guarantees and other financial support for private entities investing in space resource projects
- Something like this is being pushed by National Space Society, among others

Other ways to “Buy Down Risk”

- NASA’s COTS program helped “buy down risk” by having a guaranteed customer at the end of the process
- In addition, NASA provided payments for successful completion of each stage; providing some funding along the way for the companies while they developed the product
- This process is not that different than proposals for increasing US rare earth refining industry or nuclear power

Conclusion

- Water for propellant seems like the ideal first market in space
- SDA Bocconi's analysis provides evidence for this assertion
- Continued discussion of methods to “buy down risk” for space resources projects are needed to ensure that markets thrive in space