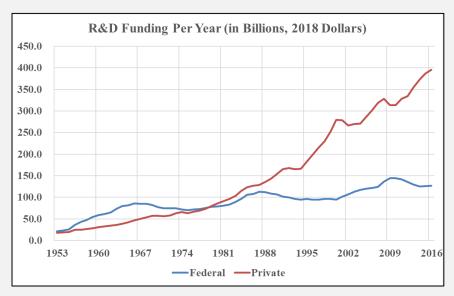
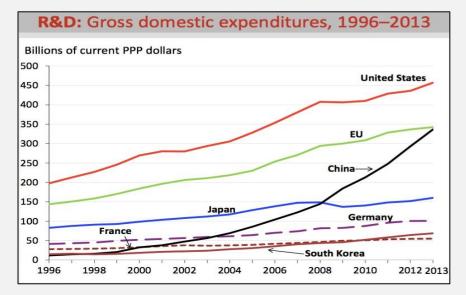


Intro to Private Sector Financing (PSF)

# Challenge: Finding more R&D funding sources



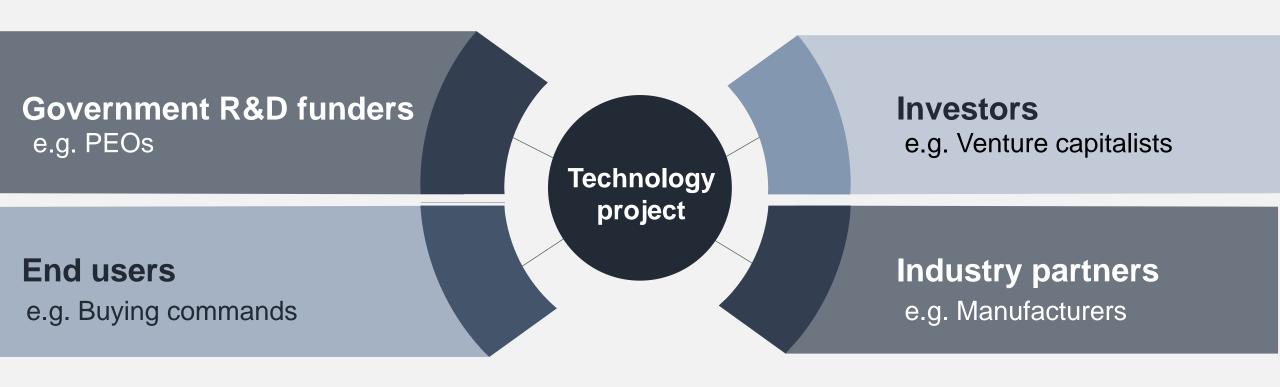
USG R&D funding is falling while private sector funding is rising, producing new capabilities faster



Competitors are forging ahead



# PSF adds flexibility to project funding



Converging multiple sources of capital to rapidly deliver capability

Raises private capital Government sells bond in exchange for

cash from investors

Pays back bond

• \$ •

Government pays investors back, principal plus interest, once the loan comes due

Government

Government has always used private capital...



Lends money to the government Investor buys government bond

Receives investment return
Investor gets paid back by
government plus an investment return



## ...and it's done it well.

## **Description & Impact**



• OT program with cutting-edge venture-funded semiconductor company



- DARPA funding: \$4M
- Prior co-funding: \$12M



 Robotic Servicing of Geosynchronous Satellites (RSGS) program to improve resilience for U.S. space infrastructure • Private co-funding: \$200M

- DARPA funding: \$400M



- Commercial Operations and Support Savings Initiative Sustainment program for upgrade of system components
- \$100M RDT&E OTA funding gave \$3+B savings



- Launch vehicle & cargo spacecraft OTA
- 300%+ cost savings vs. legacy contracting

- Private investment in exchange for monetized operational savings
- NASA funding: \$396M
- Private co-funding: \$450M+



- Small business Terran Orbital collaborated with Lockheed on nanosatellite sales to USG
- Financing enables Terran to expand manufacturing

- Lockheed Martin funding: ~\$1-5M
- Private co-funding: \$36M

# **Key Financial Concepts**

Investments are "assets" – a sequence of cash flows over time

Cash flows are more valuable when...

- ...they are larger, or costs are lower
  - ...they have an acceptable level of risk
  - ...they arrive nearer in time
- Investors will contribute more money if they perceive that the value of an asset is high





- Internal corporate funds: self-finance
- Bank lending: take out a loan
- 3 Venture capital: sell shares (seed to series B companies)
- 4 Private markets: sell shares
- 5 Bonds / credit market: sell bonds
- 6 Public markets: sell shares, conduct IPO

# Types of investors

Different investors have different risk appetites, return targets, and levels of available capital

**Internal Funds** 

\$1 trillion

Medium risk

7-15% returns

Corporate cash reserves

**Bank Lending** 

\$150 trillion

Very low risk

1-5%

Bank financing

**Bond Market** 

\$100 trillion

Low risk

3-10%

Commercial bonds

**Venture Capital** 

\$.06 trillion

High risk

15-30+%

Institutional VC

**Private Markets** 

\$5 trillion

High risk

15-30+%

Family offices, private equity, hedge funds

## **Initial Public Offering (IPO)**

The first time capital is raised by selling shares to the public.

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## Series C and Growth

Series C funding helps successful companies develop new products, expand into new markets, and grow as quickly as possible.



"B Is for Build." Series B funding is used to grow the company so that it can meet higher levels of demand.

## **Series A**

Once a business has developed a track record, obtain Series A funding to further optimize its user base and product offerings.



Investment banks facilitate public offerings.

Hedge funds, investment banks, private equity firms accompany previous investors.

Same VC investors as Series A plus other VCs that specialize in later stage investing.

Typically venture capital firms.

## Seed stage

Seed funding is the first official money that a business venture or enterprise raises.



Typically attracts friends and family, angel investors, as well as venture capitalists.

# Capital in the life of a company





Source: Investopedia.com

# PSF to support government-priority projects

## **Typical equity**

 Medium to long-term equity investments to fund project companies

## Pay-for-success

Investments to fund individual project stages. Returns based on milestone success payments or prizes

## **Royalty return**

► Investors receive royalties from product sales to government or commercial markets

## **Innovation bonds**

Government R&D funds securitized as bonds

## Full project investments

Advance agreements for multi-stage projects to finance the next tranches as project stages are completed

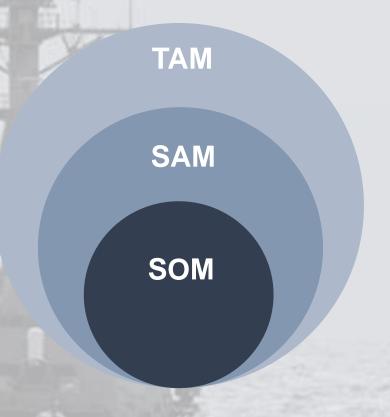
## **Project portfolio**

► Debt, equity or royalty investments in portfolios of multiple projects aiming at one or more target products



## Information that investors need

- Size of government & commercial market
  - Also known as total addressable market (TAM)
  - Describe the market need
- Potential government buying assurances/estimates
  - When will government money be available
  - Specific customer adoption plan
- Key company information:
  - Revenues and/or earnings before interest, taxes, depreciation, and amortization (EBITDA)
  - Assets and liabilities
  - Company past performance
  - Company management



Investors are looking for companies with great ideas as well as a strong strategy for turning ideas into a successful, money-making business.

# How it can work: a sample deal

- 3 parties: Government R&D funder, company, investor
- Investor pays company to perform science on day one
- Government R&D funder pays investor:
  - On science success: 110% of commercial science cost
  - On science failure: pay nothing, or agreed partial amount



## Legacy R&D approach (e.g. FAR cost-plus)

- 2 parties: Government R&D funder, company
- Government R&D funder pays company to perform work:
  - On science success: 100% of science cost +~30% admin burden & +~30% time
  - On science failure: pay same as for success



# Addressing everyone's interests

Funding & oversight

## **Government R&D Agency**

- Contribute R&D funding
- Technical oversight of R&D projects

## **R&D Performers**

- Develop products
- Agree to make revenuesharing payments to investors

## **Products & services**

**Purchases** 

## **End Users**

- Signal need
- Pay for and use products

Project funding
Revenue sharing

## **Investors**

- Invest agreed amounts
- Receive agreed returns





First orbital flight of Falcon 1 rocket

Resupply of International Space Station

SpaceX becomes one of the world's most valuable private companies

\$396M government funds \$450M+ private investment

300%+ cost reduction vs legacy contracting

Google and Fidelity put \$1B into SpaceX



# SpaceX Other Transactions Agreement

## **Key aspects**

- Repeated rounds of private financing
- Financing milestones treated the same as technical milestones

### SPACE ACT AGREEMENT BETWEEN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AND

SPACE EXPLORATION TECHNOLOGIES CORP. FOR

COMMERCIAL ORBITAL TRANSPORTATION SERVICES DEMONSTRATION (COTS)

#### BACKGROUND

- A. NASA has established the Commercial Crew/Cargo Project Office at the Johnson Space Center as part of the Exploration Systems Mission Directorate. The objectives of the Commercial Crew/Cargo Project are to:
  - implement U.S. Space Exploration policy with an investment to stimulate commercial enterprises in space,
  - facilitate U.S. private industry demonstration of cargo and crew space transportation capabilities with the goal of achieving reliable, cost effective access to low-Earth orbit, and
  - create a market environment in which commercial space transportation services are available to Government and private sector customers.
- B. This SAA represents Space X and NASA's commitment to conducting the initial development and demonstration phase of the Commercial Crew/Cargo Project. Specifically, the Space X innovative approach to meeting the goals of the project is outlined in Appendix 1.

#### ARTICLE 1. AUTHORITY

This Agreement is entered into by the National Aeronautics and Space Administration, located at 4<sup>th</sup> and E Streets, SW, Washington, D.C. (hereinafter referred to as "NASA" or Government), and Space Exploration Technologies Corp., (hereinafter referred to as "SpaceX" or "Participant") with a place of business at 1310 E. Grand Avenue, El Segundo, CA 90245. NASA's authority to enter into this Agreement is in accordance with the authority set forth in Sections 203(c)(5) and 203(c)(6) of the National Aeronautics and Space Act of 1958, as amended and NPR 1050.1G. This agreement will be implemented by NASA at the Lyndon B. Johnson Space Center in Houston, Texas.



