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Space Business Incentives Act H.R. 1953**

Testimony Prepared for Presentation to  
Committee on Science  
U.S. House of Representatives  
March 5, 1996

By Molly K. Macauley, Senior Fellow  
Resources for the Future

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Mr. Chairman and distinguished members of the committee and of the National Space Society, thank you for inviting comments on the Omnibus Space Commercialization Act of 1996 and the Space Business Incentives Act H.R. 1953. I am a senior fellow with Resources for the Future, an independent, nonpartisan research and educational organization concerning itself with natural resources and the environment. The views I outline in these comments are mine; Resources for the Future takes no institutional position on legislative, regulatory, judicial, or other public policy matters.

I am an economist and have been a member of the Resources for the Future staff since 1983. During that time, I have specialized in the economics of space activities. I have conducted research on space transportation and space transportation vouchers; economic incentive-based approaches, including auctions, for the allocation of the geostationary orbit and the electromagnetic spectrum; the management of space debris; the allocation of resources on space stations; the public and private value of remote sensing information; and the roles of government and the private sector in commercial remote sensing. This research has taken the form of books, lectures, and published articles.

Before outlining specific comments on the proposed legislation, I would like to note that I am a space enthusiast insofar as I support public funding of space exploration activities for scientific and research gain. I also welcome space commercialization. However, using the federal income tax code to advance commercialization may not meet the expectations of space enthusiasts and in fact may well have unintended, undesirable consequences for space commerce. In short, the proposed tax breaks may well retard space business.

If it is deemed necessary for taxpayers to support commercial space, then there are other, more effective approaches that might be taken. For these reasons, the Omnibus Space Commercialization Act and additional provisions that might be added to it are likely to be a better approach than the tax-based Space Business Incentives Act.

### **Space Business Incentives Act of 1995**

I am always dismayed when our tax code is used for social engineering rather than strictly to raise revenue. However, there are tax breaks for everything from child care to the sale of reindeer. Space enthusiasts argue, "Why not us, too? After all, space

commerce represents investment in our future, and will in turn generate jobs, tax revenue, and other benefits. "

The problems with this claim are twofold. All "me-too" arguments are inadvisable when the government has recently ground to a halt over a balanced budget. No tax loophole should be given a free ride, even if it were just for a few hundred million dollars in forgone revenue. In addition, even if space commerce were one of the best investments to be made, and if it were widely agreed that its encouragement needs government intervention, then there are other ways to facilitate space commerce rather than tax subsidies.

Some specific concerns with the tax bill are as follows:

***Tax-Exempt Bonds.*** Tax-exempt bonds are an expensive way to foster space industry growth. The subsidy to the investor is likely to be outweighed by the revenue loss to the general taxpayer. To illustrate, suppose two potential space investors, A and B, face marginal income tax rates of 31% and 15%, respectively. If the market rate of return on taxable bonds is 15%, then the after-tax return to A is 10.4% and to B it is 12.75%. To encourage both investors to buy space bonds, the net rate of return must be at least 12.75%. Suppose the space bonds yield just slightly more than 12.75% and that both investors purchase the bonds. The key point is that some of the tax break is wasted on A. He would have been willing to buy the bond at any yield greater than 10.4% yet he receives 12.75%.

The net effect on government revenues is that taxpayers lose 31 cents of each dollar of interest payments that investor A would make on a taxable bond, or about \$5 per every \$100 worth of bonds issued (.31 times 15). In short, the net effect of tax-exempt bonds is zero only for those investors who are just on the margin of choosing tax-exempt versus taxable securities. For all others, the subsidy is outweighed by the revenue lost to the taxpayer.

Supporters may argue that the space investments supported by the bonds will generate tax revenue. This is true. But there are other means of encouraging the investment and generating tax revenue that do not lose \$5 for every \$100 invested.

***Exclusion of Gain on Sale of Stock.*** There are sound reasons to tax most types of capital gains, although probably at a much lower rate than the present tax system and after indexing the gains for inflation. The tax system that is likely to best promote a healthy economy is one in which there are as few distortions as possible between ordinary income and income received from other assets. This means taxing all forms of income, including that generated by capital gains related to space investments.

***Tax Exemption of Space Manufacturing Revenue.*** This exemption may attract investment but not necessarily because space manufacturing makes technical or economic sense. The exemption simply distorts the production and location decision of manufacturers. Could General Motors write off the cost of automobile manufacturing if a ball bearing is manufactured in space? Could Merck write off a new drug if it had been test manufactured in space?

**Potential for Abuse.** Interest deductions and preferential treatment of certain kinds of income can create major money-making opportunities without producing a healthy commercial space industry. For instance, it is generally agreed that many taxpayers deduct interest from loans whose proceeds are used to purchase tax-exempt bonds. This is illegal, but it is exceedingly difficult to enforce because the authorities must prove that the money was used to buy the bonds. For example, suppose a taxpayer with a 31% marginal tax rate can borrow at 10%. By investing in a tax-free space bond, the tax bill is reduced by 31 cents for every \$1 of interest paid. The effective borrowing rate is thus 7%. If the going rate of return on the tax-exempt bond is 8%, then the taxpayer can borrow at 7% and lend to space investors at 8%. This tax arbitrage does not necessarily foster sound investment in space commerce.

Another typical source of misuse is the possibility that existing companies will recapitalize merely to take the tax breaks but without making the type of productive investment sought in the legislation. Or, investments might be made solely for the tax advantages yet the investments may simply not make sense. For instance, recall the experience with renewable energy tax credits permitted years ago in the Omnibus National Energy Act. Investments in solar, geothermal, biomass, windfarm, and other energy technologies were poorly carried out and set back these energy industries at least a decade. As another example, section 29 tax credits in the Energy Consumption and Production Act led to subsidized and unsubsidized supplies of natural gas—a very undesirable result of tax breaks.

Definitions in the tax code also are a potential source of abuse. Tax accountants and attorneys are the industries that gain, not the space industry, when there is dispute over interpretation of the code. "Commercial space centers," "space manufacturing," and in particular, "corporation substantially engaged in space-related activities" may be too general to ensure that the legislative intent is realized.

These concerns suggest strongly that the statutory beneficiaries of the proposed legislation will not necessarily be the intended beneficiaries. Furthermore, the cost of administering these new provisions to ensure that they are appropriately used may well exceed the revenue collected.

**Tax Capitalization.** Another general effect of the proposed tax provisions is that if these tax breaks become capitalized, they can actually make space activities more expensive. The individuals who gain are the owners of the companies at the time the tax breaks are enacted; for all newcomers, space can become a more expensive place to do business. Moreover, a result can be a private sector whose survival depends entirely on the tax breaks.

**Alternatives to Tax Breaks.** If taxpayer support of commercial space is deemed in the public interest, then why not subsidize commercial space activities with direct grants from the federal government? If the grants are wisely targeted to the activities which would attract investors anyway, then the gross benefits of commercial success are the same. The net benefits are larger under grants than under tax breaks, however, for the reasons described above.

To be sure, government grants are problematic: is the government good at picking winners and losers? Are there excessive administrative costs to be borne by the government and grantees? Do grants crowd out private investment? The same questions can be asked of tax breaks, but at least the use of grants can be controlled and sunset provisions more easily upheld than in the case of the proposed tax schemes.

Certainly some grant programs for commercial space have worked well, such as the Earth Observations Commercialization Application Program. Key to its success have been the required cofunding and resources placed at risk by the private sector partners, as well as program portfolio selection made by business experts (rather than government employees or tax accountants—the former a problem with government commercialization efforts, and the latter a problem with tax-based approaches).

### **Omnibus Space Commercialization Act**

This act also offers good alternatives to tax preferences. Some notable additional provisions might include these:

***Section 106, Space Station.*** To avoid the pricing problem that plagued the shuttle program in establishing fees for government and commercial payloads, the space station program might consider various fee-based mechanisms for allocating resources (utilities, astronaut time, and so forth) on board the station. Economists at the California Institute of Technology have done innovative research on how to operate such mechanisms.

***Section 111, Purchase of Space Science Data and Section 302, Acquisition of Earth Remote Sensing Data.*** Voucherlike approaches will permit these purchases to be decentralized so that individual science teams may autonomously act to make their data buys. Such decentralization would be preferred to an agency-wide or NASA code block purchase. In the case of earth remote sensing data, the private sector has shown some interest in supplying the data-archiving facilities for Mission to Planet Earth (MTPE). Heretofore, archiving has been considered the domain of the public sector. The point is that the full range of MTPE activities should be considered for possible private sector interest.

***Section 404, Use of Excess Intercontinental Ballistic Missiles.*** The prohibitions outlined in this section may be intended to support a domestic, commercial space transportation industry. However, do they support other commercial space activities that need low-cost space access? Have the costs and benefits—both short- and long-run—been taken into account in forming this section of the bill?

### **Summary**

Imperfections in the capital market and technical risk are often thought to characterize the problems of commercializing space activities. Yet communications satellites surmounted these seeming barriers, and perhaps quite soon, remote sensing spacecraft will also do so. In other industries, such as pharmaceuticals, large capital costs and significant uncertainty associated with the regulatory process and the commercial

market are also routinely overcome without (or despite) government intervention. Perhaps the challenge of commercial space lies not with the supply side addressed in many of the proposed provisions, but with the demand side (namely, what are the useful things to do in space, and why might taxpayers want to subsidize them). Responding to that challenge may be the next best step in forming commercial space policy.