

FEDERAL AVIATION ADMINISTRATION

AN ASSESSMENT OF INNOVATIVE FINANCING OPTIONS FOR THE AIRPORT IMPROVEMENT PROGRAM

*A Report Prepared Under the Requirements of Section 520 of the Federal Aviation
Administration Authorization Act of 1994.*

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EXECUTIVE SUMMARY

Section 520 of the Federal Aviation Administration (FAA) Authorization Act of 1994 (Public Law 103-305) directs the Secretary of Transportation to conduct a study of innovative approaches for using Federal funds to finance airport development as a means of supplementing financing available under the Airport Improvement Program (AIP). The Secretary is mandated to consider (at a minimum):

- Mechanisms that will produce greater investment in airport development per dollar of Federal expenditure;
- Approaches that would permit entering into agreements with non-Federal entities, such as airport sponsors, for the loan of Federal funds, guarantee of loan repayment, or purchase of insurance or other forms of enhancement for borrower debt, including the use of unobligated AIP contract authority and unobligated balances in the Airport and Airways Trust Fund;
- Means to lower the cost of financing airport development.

Accordingly, this study examines the following matters of Congressional interest:

1. Several feasible options for innovative Federal approaches to airport finance;
2. The change in airports' cost of borrowing funds for capital investment projects ("the cost of capital") as a result of innovative financing mechanisms (potentially reducing costs to airport users);
3. The extent to which reductions in the cost of capital would increase or accelerate airport borrowing for the purpose of capital investment;
4. The extent to which increased or accelerated airport borrowing would precipitate the addition of *more* infrastructure to the airport system versus a *substitution* for other forms of available airport finance (such as state and local grants); and
5. The possibility that options for innovative finance could help diminish airline near term financial constraints that inhibit timely construction of needed airport improvements.

OPTIONS

The options listed below were developed to respond to Congressional direction for this study. Reviewed in consultation with over 150 financial services and airport industry stakeholders, this study identifies and assesses four feasible Federal options for innovative airport finance:

Option 1: Use AIP grants to fund debt repayment reserves of airport revenue bond issues.

Option 2: Authorize Federal guarantee of airport loans, analysis assuming retention of tax exempt status.

Option 3: AIP eligibility for commercial bond insurance.

Option 4: Institute an airport loan fund.

These options seek to reduce the cost of borrowing and increase the leverage airports can exercise over their Federal financial assistance. The desired result is greater net investment at congested and under-developed airports for each dollar of Federal expenditure. However, these techniques need to be consistent with government financial policies, including policies which take into consideration potential risks to the Federal government and the efficient and effective use of Federal financial assistance. For example, Federal loan guarantees and direct loans are appropriate only when it is necessary to alleviate a credit market inefficiency, or when it is necessary to achieve specified Federal objectives by providing a credit subsidy and a credit subsidy is an efficient way to meet those objectives on a borrower-by-borrower basis.

AIRPORT FINANCE UNDER CURRENT POLICY

Airport finance today is marked by a prominent Federal role and an even more significant role of debt finance. The Federal role is exerted in two ways, (1) AIP formula and discretionary grants funded by user taxes on airline tickets, aircraft fuel, freight waybills and international departures, and (2) an exemption from Federal tax on interest income for holders of airport bonds (a "tax expenditure" funded by the general taxpayer). In addition, the Passenger Facility Charge program (PFC), administered by the FAA, generates local funds to finance airport improvements.

Between 1985 and 1995, the AIP financed 14 percent of all capital spending at large commercial airports, 28 percent at medium-sized commercial airports and 41 percent at small airports (small commercial airports as well as reliever and general aviation facilities).

The Federal tax exemption shaves almost two full percentage points off interest costs for airport borrowers of all sizes, an estimated saving of nearly \$1 billion per year for airports over the period 1985 to 1993. Although airports are locally owned and operated, Federal grant and tax exemption policies assist significantly in airport capital development.

The PFC program, now generating \$1 billion annually, provides a extremely powerful tool for financing critically needed airport development, particularly at the nation's largest airports.

Fully one half of the total revenue generating potential of the PFC program is concentrated at the top ten enplaning airports in the country (seven of the top ten airports are currently collecting PFCs). This has the effect of concentrating PFC revenue at airports with the greatest capacity development and noise mitigation needs. Although credit rating agency concerns about FAA authority to terminate (for cause) an airport's PFC collection have limited, to some degree, PFC revenue leveraging potential, FAA has worked to alleviate investor concerns that FAA might act precipitously in such cases. For airports using PFC revenue as sole security for airport revenue bonds, the FAA offers a detailed agreement to notify all parties involved with the bond issue about possible PFC violations (excluding those pertaining to airport access restrictions). In addition, the agreement provides for multiple opportunities to remedy violations and remove all threat of termination. The FAA's efforts have helped to persuade banks and insurers to provide credit enhancement for PFC secured bonds, and have moved two credit rating agencies to begin considering PFC secured debt for possible investment grade rating. The FAA is committed to work with the airport finance community to further increase the leverage potential for PFC revenue.

Clearly, powerful policy instruments through which the Federal government can exert significant influence over airports' access to debt capital and borrowing costs are in place. The AIP reduces the amounts that airports need to borrow for capital development while the Federal tax exemption reduces airport interest costs on borrowed funds. The PFC program provides additional revenue for airport development. As a result of these policies and programs, and together with the mature nature of airport financial management practices, the nation's commercial airports today do not face systemic or widespread obstacles to finding willing investors, financing debt-service reserve funds, obtaining bond insurance and other debt guarantees, and generally exercising leveraging strategies that foster airport development.

Although the potent Federal role and mature airport investment market create a healthy environment for airport investment, that environment is not entirely fluid with respect to changing investment opportunities and economic needs. At large and medium-sized airports, where major airlines exert significant influence over the scope and timing of investment, near-term financial realities facing airline management can create divergent airport-airline perspectives on the appropriate timing and scope of capital improvements due to their immediate implications for landing fees and other airline costs. Although this study uncovered no evidence of systemic development constraints at large and medium-sized airports, local situations are known to arise in which *economically* worthwhile investment initiatives (such as congestion and noise-reducing projects) are delayed or scaled back for *financial* considerations.

At small airports there is evidence of financial barriers to the desired level of development of terminal and land-side facilities. This can occur when such facilities are incapable of generating sufficient net revenues to cover debt-service (for revenue bonds, for example). It can also occur when, without sacrificing higher priorities, states and localities are unable to provide allocations

from the limited pool of funds they are able to generate through the sale of securities backed by the local tax base (general obligation bonds).

IMPACT OF INNOVATIVE FINANCE ON AIRPORT BORROWING COSTS AND NET NEW INVESTMENT

Given the investment climate outlined above and the effectiveness of current Federal policies and program levels, the prospective impact of innovative financing mechanisms on airport development needs to be viewed from three perspectives:

- *General System-Wide Development.* Analysis indicates low-to-modest potential gains for airport development;
- *Specific, Targeted Development.* Analysis indicates a potentially pivotal role for innovative financing mechanisms; and
- *Development Under a Fiscally Constrained Federal Program.* Analysis indicates both a significant system-wide impact and targeted role.

System-Wide Impacts of Innovative Financing

Summary Table 1 indicates that the option found most effective analytically for large airports (Federal guarantee of airport debt, analysis assuming retention of tax-exempt status) would reduce interest expenses by an estimated 1.93 percent, or \$124,300 on the average-sized bond issue (\$113 million for large airports in 1995). If airports were to leverage such a sum by using the interest cost saving to fund added debt service, an extra \$2.14 million would actually be available for construction and related purposes. Although this amount represents a small percentage of the total cost of a new runway (about \$100 million), taxiway (about \$60 million) or terminal modernization (about \$50 million), it is meaningful in relation to the cost of collateral opportunities to enhance the effectiveness and local acceptability of such investments such as advanced runway lighting systems and noise mitigation. Alternatively, an airport could lower its annual rates and charges by \$124,300. However, the Administration opposes providing tax-exempt status to any securities which also receive Federal guarantees.

From a small airport perspective, projected impacts are proportionately more significant. The provision of Federal guarantee of airport debt, analysis assuming retention of tax-exempt status (Summary Table 1, Option 2) for example would shave an estimated 5.85 percent off the debt service bill for a small airport participating in the bond market. For an airport disseminating the average-sized bond (\$16 million for small airports in 1995) at interest rates prevailing in early 1995, this saving could be leveraged into an additional \$994,000. For a small commercial

airport such a sum is large enough to influence the scope of a project (the size of a terminal building expansion, for example). Alternatively, an airport could use savings to lower its annual rates and charges. However, the Administration opposes providing tax-exempt status to any securities which also receive Federal guarantees.

To what extent would savings in borrowing costs precipitated by innovative financing mechanisms lead airports to invest more heavily in airport facilities? In light of the moderate reductions in interest costs likely to follow from such mechanisms, and given that large and medium-sized airports do not face systemic financial obstacles to capital investment today, lower debt-financing costs are projected to yield moderately higher levels of system-wide airport. Such increases are in the range of three percent under the most promising innovative financing options, as shown in Summary Table 1.

The role of innovative finance in promoting system-wide development at small airports is more difficult to gauge. Many of the nation's 3,500 small airports use the private capital market to finance investment. Yet some small airports are found to face constraints to their participation in the capital markets, particularly for terminal and other groundside developments. However, the constraint often stems from low passenger and aircraft volumes and weak operating revenues. Statistical analysis of capital borrowing by small airports in response to reductions in the cost of capital indicates virtually no measurable system-wide response. Thus the extent of interest cost reductions projected in Summary Table 1 do not appear sufficient to precipitate significant inroads on system-wide capital development.

On the other hand, targeting innovative financing mechanisms to particular airports could have significant implications for local airport economic development.

Impacts of Targeted Innovative Financing

The modest system-wide impacts projected above mask potentially larger impacts in local situations where factors such as airline financial restraint or local government bonding restrictions delay worthwhile projects or diminish their scope. While there is always a risk that interest rate subsidy can induce excessive capital spending - i.e., projects that would not pass a rigorous market test of merit - it is known that airline financial conditions and influence can and do diminish the scope of worthwhile investments at large and medium-sized airports or put them on hold, sometimes for years. Airline influence over timing and scope of airport investment is one of the reasons Congress authorized the Passenger Facility Charge program. Although the dollar-volume of worthwhile airport investment that is foregone or delayed due to such conflicts is unknown, innovative financing mechanisms that were *carefully targeted* on such cases could help alleviate investment bottlenecks.

Impacts of Innovative Financing Under Federal Fiscal Restraint

A great many Federal programs are coming under inevitable pressure as the Administration and the Congress forge plans to eliminate the Federal deficit. While large and medium-sized airports draw less than 14 percent of their investment capital from the formula component of the AIP program, discretionary grants frequently account for 25 percent or more of a project's total capital cost. Small airports moreover draw more than 40 percent of their investment capital from Federal grants.

Innovative financing mechanisms could help airports keep pace with aviation requirements in the face of a fiscally restrained AIP. For example, compared to grants, airport loan guarantees create a smaller Federal budget liability, because only the actuarial risk of loan loss is “scored” as a budget “outlay”. At the same time, by insulating airlines from some of the burden created by diminished grants, such innovative Federal financing mechanisms could help airports keep up with their capital requirements.

Which mechanisms are likely to promote the aims of innovative financing mechanisms most cost- effectively? Summary Table 2 provides a comparison among the four mechanisms examined in this study. Taking together considerations of effectiveness, complexity and administrative cost, the use of AIP funds to pay for commercial bond insurance offers the most promise. This approach would assist airports that cannot afford or qualify for bond insurance by permitting such airports to purchase commercial bond insurance with AIP funds. This option would have to be implemented to ensure that the holders of such bonds would have no recourse to the Federal Government in the event of default by the issuer of the bond and insolvency of the bond insurer.

Loan guarantees would also rank high among the options studied if there was no change in tax-exempt status. These mechanisms score especially highly in relation to small airports, doubtless the most vulnerable airport sector from the perspective of capital shortfalls. However, the Administration opposes providing tax-exempt status to any securities which also receive Federal guarantees.

CONCLUSION

While other specific innovative financing alternatives could usefully be examined, the appropriate packaging and design of any innovative financing program would depend upon the budgetary status of the AIP program.

Under current AIP program levels, innovative financing mechanisms would need to be carefully targeted in order to avoid the substitution of Federal dollars for capital dollars available from

non-Federal sources. Targeting might give special weight to small airports, which face growing state and local fiscal restraint in addition to limited access in the capital markets; yet some large and medium-sized airports also face constraints, albeit those imposed by the financial condition of major airlines.

On the other hand, if future funding levels for the AIP program were significantly reduced, a more generally available innovative financing program would be suitable and perhaps necessary to help sustain required airport development.

Today's Federal budget realities dictate the consideration of a wide range of options for change, including FAA reorganization, and financing reform. In this context of rapidly developing ideas for Federal deficit reduction, the Administration is proposing, as part of its AIP reauthorization bill, a two part follow up to this study. First, the Administration proposes the formation of a select panel, drawn from the aviation, financial, and local government communities with an interest in airport development. The panel will be charged with assessing the widest possible range of mechanisms to finance airport development, including modifications to the Passenger Facility Charge program, public/private partnerships, and the creation of new financial institutions and techniques. The Administration's second proposal provides statutory authority for the FAA Administrator to test and evaluate the effects on airport development of innovative financing proposals involving AIP funds. Proposals thus tested which are found to provide greater leveraging for Federal dollars and have a positive effect on investment in airport infrastructure would provide a basis for future legislative proposals to further broaden airport development financing options.

Summary Table 1: Impact of Innovative Financing Options

Option	Impact on cost of capital, In Percent			Impact on Airport Capital Borrowing In Percent		
	Large Airports	Mid-sized Airports	Small Airports	Large Airports	Mid-sized Airports	Small Airports
1. AIP Funded Debt Service Reserve	-0.26	-0.09	-0.34	0.41	0.14	< 1.00
2. Federal Guarantee for Airport Loans *	-1.93	-1.78	-5.85	3.05	2.91	< 1.00
3. AIP Funded Bond Insurance	-1.54	-1.60	-5.51	2.42	2.62	< 1.00
4. Establish Airport Loan Fund	-0.96	-0.78	-0.97	1.52	1.28	< 1.00

* Statistical results assume that airport debt receives a Federal guarantee and retains its tax-exempt status. However, it is a long-standing

Federal policy, as well as law, to prohibit any security that receives a Federal guarantee from also retaining tax-exempt status.

Summary Table 2: Ranking of Innovative Financing Options

	Impact on Capital Investment (Ranking; "1" denotes highest)			Complexity in Implementation	Administrative Cost
	Large Airports	Medium Airports	Small Airports		
AIP Funded Debt Service Reserve	4	4	4	Negligible	Negligible
Federal Guarantee for Airport Loans	1	1	1	Highly Complex Due to Current Tax Code	Relatively Low
AIP Funded Bond Insurance	2	2	2	Negligible	Negligible
Establish Airport Loan Fund (Conservative Fund Management)	3	3	3	Complex	Significant Start Up, Moderate On-going Costs

II. AIRPORT FINANCE UNDER CURRENT FEDERAL POLICY

Although airport capital investment today is funded by a combination of airport cash reserves, debt capital raised in the municipal bond, commercial loans, and grants from state and Federal governments, it is the sale of tax-exempt bonds and the provision of Federal grants through the AIP program that finance the lion's share of major capital projects.

THE FEDERAL ROLE IN AIRPORT FINANCE

Financed since 1970 by user taxes on domestic airline tickets, aircraft fuel, freight waybills, and international departures, the Federal government funded \$11.2 billion in formula and discretionary grants over the period 1985 to 1993 (Table 2.1). Distributed through the AIP, just over 65 percent of the funds were allocated to primary commercial airports while 13.1 percent (\$1.46 billion) were used in capital projects at reliever airports. As shown in Table 2.1, more than half the AIP spending over the period 1985 to 1993 was used for "airside" development, including runway, taxiway and apron infrastructure; 19 percent went to noise-related projects; and the remainder helped pay for safety, security, terminals and other buildings, roadways and planning activities.

The volume of AIP spending has placed the Federal government second only to the municipal bond market in financing airport capital development, although the Federal role has declined significantly since 1980. Over the period 1985 to 1993 the Federal percentage of total airport development funding for primary commercial airports was 24 percent (Table 2.2), down from 35 percent over the period 1978 to 1982.¹

The Federal role in airport finance varies markedly among different sized airports, with small airports using the program most intensively. As shown in Table 2.2, Federal funds account² for 14.2% of spending by large commercial airports, 28% of spending by medium-sized commercial airports, and 41% of spending by small airports.

In 1990 Congress relaxed its previous prohibition on the use of passenger facility charges (PFC). Congress specified conditions under which airports could use PFC for capital development and authorized the FAA to approve an airport's application to levy the charge. Under these conditions, PFC revenues may be used for airport planning, airside development, terminal development (including gates and related areas), noise compatibility planning and implementation, and airport access. The PFC program currently generates \$1 billion annually for airport development. The FAA has worked

¹ Congressional Budget Office, *Financing U.S. Airports in the 1980s* April 1984

² See appendix A for FAA airport size definitions.

closely with the airport finance community to increase PFC revenue leveraging potential. In response to these efforts, banks and insurers have been persuaded to provide credit enhancement for PFC secured bonds, and two credit rating agencies have been moved to consider PFC secured debt for investment grade rating. The FAA is committed to work with the airport finance community to further increase the leverage potential for PFC revenues.

Large and medium-sized hub airports that levy a PFC are required to concede AIP entitlement funds by an amount equal to one-half their PFC revenues (to a maximum of 50 percent of their AIP entitlement). One quarter of these funds are transferred to the AIP discretionary fund, half of which is used for grants to small hub airports and half for a newly created *Small Airports Fund*. Between 1990 and 1994, 144 airports were approved to levy a PFC, generating approximately \$1 billion annually for airport development. Entitlement funds returned by large and medium-sized airports through the AIP program funded \$7.0 million in grants to small hub airports, \$28.0 million in grants to non-hub airports and \$13.9 million in grants to noncommercial service airports.

THE ROLE OF DEBT CAPITAL IN AIRPORT FINANCE

Evident in the above is the fact that airports of all sizes and functions raise investment funds by borrowing money. Most borrowing takes place in the municipal bond market but commercial loans are not uncommon for relatively small projects. Airports today are regarded as premium-grade investments whose securities are held by mutual funds, households, and other risk-conscious investors. Borrowing on this scale indicates that airport sponsors are sophisticated enterprises that perform well under three tests of access to capital markets:

- **Management framework of financial systems and controls that accords with generally accepted principles of financial management.** Lenders insist on sound financial management systems and controls;
- **Strong financial performance, creditworthiness and competitiveness for debt capital.** Lenders demand that past and expected revenues, costs and key financial ratios demonstrate the airport's ability to repay debt with acceptably small risk of delay or default;
- **Regular participation in the market.** Lenders gain confidence when borrowers display regular and reliable participation in the capital markets.

Airport Financial Management

Although airports in the United States are publicly owned and managed, they operate in conjunction with private industry, namely the commercial airlines, which are the airports' link to their customers. This unique public/private character distinguishes the financial operation of commercial airports from that of wholly public utilities or wholly private enterprises, and shapes airports' management practices, the pricing of airport facilities and services, and approaches to airport investment planning.

At most commercial airports, the financial and operational relationship between an airport and the airlines it serves is defined in legally binding agreements (called "use agreements") that specify the management framework of systems and controls within which the risks and responsibilities of airport operation are to be shared between the two parties. Many approaches to airport financial management have evolved over the years, but all are explicit hybrids of two basic methodologies, *residual* and *compensatory*.

Under the residual approach airlines collectively assume financial risk by agreeing to pay any costs of running the airport that are not allocated to other users or covered by non-airline sources of revenue (such as parking fees, concessions, Federal grants). Under the compensatory approach, the airport operator assumes the financial risk of running the airport and charges the airlines fees and rental rates set so as to recover the actual costs of the facilities and services that they use. Hybrid approaches typically divide the airport into cost centers and operate some on a residual basis and others according to compensatory principles.

Many years of experience with these approaches to airport financial management has convinced the bond market that airports operating under one or the other (or a hybrid) have systems in place that are effective in managing and controlling airport revenues and costs effectively and with due regard for the needs of lenders.

Airport Financial Performance, Creditworthiness, and Competitiveness in Capital Markets

Like any enterprise, an airport's ability to borrow money hinges foremost on its financial strength. In rating the creditworthiness of a major bond issue, rating agencies look closely at financial ratios which measure the airport's availability of revenues beyond those needed to pay regular operating expenses ("operating ratios") and ratios designed to measure the airport's ability existing and new borrowing for capital investment ("debt ratios").

Commercial airports tend to perform as well or better than borrowers in the municipal bond market generally. Commercial airports typically use a smaller share of revenue to

cover operating costs than either electric utilities or water supply and wastewater treatment authorities. They have been found to operate with smaller operating margins than highway toll facilities, however.³ Commercial airports have also been found to carry a high level of debt relative to their total assets compared with power and water utilities. However, despite their relatively high debt ratios, airports consistently appear able to service more new debt than such utilities because of their lower operating and maintenance costs. Airports also hold substantially greater reserves against unforeseen shortfalls in revenue.

The competitiveness of airports in the capital markets can be gauged by four conventional indicators of investment quality:

- **Bond Ratings** -- a system used by major investor services to grade bonds according to investment quality (see Appendix B);
- **Interest Costs** -- the interest paid by airports to attract investors relative to what other municipal enterprises pay;
- **Insurability** -- the affordability of purchasing bond insurance in order to improve credit ratings and reduce interest costs;
- **Defaults** -- the frequency with which airports have defaulted on a bond issue.

Bond Ratings. For the 955 airport bonds issued between 1985 and mid-1995, all but one has received an "investment grade" from the two major U.S. investment rating services, Moody's Investors Service and Standard & Poor's Corporation. The bond issues include "revenue bonds," those backed by airport revenues from fees and charges, and general obligation bonds, those backed by the full faith and credit of the municipal tax base.

While investors today clearly have considerable confidence in airport bonds, ratings do vary between the top and medium grades (see Figure 2.1), with larger, medium-sized and small airports performing about the same. A medium grade means that rating firms see the investment as carrying a measure of speculative risk. Anything below medium grade denotes a significant degree of speculative risk.

General obligation bonds, which are rated according to the economic vigor of an entire state or municipality, draw the best ratings. Revenue bonds, on the other hand, draw ratings according to the fiscal condition of the airport itself. Since more than 90 percent of all airport bonds (in terms of dollar volume) are secured with airport revenues, the criteria investor services use to rate such bonds are central to such bonds' marketability.

³ Based on the analysis of credit reports published by Moody's Investor Service.

These criteria include a range of factors, including the financial performance of the airport, the vitality of local economic conditions, the strength and nature⁴ of passenger demand, and the nature of the airport's relationship with its tenant airlines..

Credit analysts also examine rate covenants and bond resolutions when rating airport revenue bonds. The rate covenant is the airport's promise to establish rates, fees and charges so as to provide net revenues (gross revenues minus operating and maintenance costs) commonly equal to 1.25 to 1.40 times annual debt service. The bond resolution establishes a number of special funds and accounts to facilitate the management of bond proceeds and revenue. Together, the rate covenant and the bond resolution create a cushion for bond holders against the risk of temporary shortfalls in an airport's ability to service its debt.

Interest Costs. The difference between interest costs paid by airports and by other public enterprises since 1985 indicates that airports generally hold a strongly competitive position in the municipal bond market.⁵

Like municipal bonds in general, airport bonds are traded at prices that reflect both general economic conditions and the credit quality of the airport enterprise (or state or municipality in the case of general obligation bonds). An indication of competitiveness is provided in Table 2.3 which indicates that interest costs for large commercial airports have traded at as much as 74 "basis points" *below* the interest cost index for all municipal bonds (a basis point is one one-hundredth of a percentage point). Bonds issued by medium-sized airports trade at somewhat "above market," possibly an indication of the high degree of investment in this category to accommodate the growth in airline hubbing activity over the 1985 to 1995 period. Bond rating agencies and bond underwriters tend to view hubbing-related capital investment as being relatively more risky due to the transient rather than home-based nature of the underlying traffic. Simply stated, a connecting carrier can choose to shift its hubbing operations to another airport. If so, the traffic and associated airport revenues are lost as a basis for servicing the airport's debt. The same is obviously not the case for home-based traffic.

Small airports consistently draw interest costs below the average for municipal bonds in general (as seen in Table 2.3) and below the interest costs incurred by larger airports. One reason for this is the tendency among smaller airports to depend relatively more on general obligation bonds, bonds that routinely fetch stronger ratings and lower interest costs than revenue bonds (see earlier). A second reason turns on the smaller and more home-based nature of these bonds. Smaller issues are naturally less risky and the average

⁴ Rating agencies prefer origin-destination demand over connecting demand since the latter is susceptible to airline management decisions regarding hub location.

⁵ The Congressional Budget Office drew the same conclusion from data for the period 1978 to 1982. See U.S. Congressional Budget Office, April 1984.

sized bond issue among small airports over the 1985 to 1995 period was less than one-quarter the average sized large airport bond issue. As well, small airports are rarely investing for the purpose of catering to significant volumes of connecting traffic and this too reduces their relative degree of risk.

Insurability. The fact that airports in all size categories can afford such insurance is a signal of creditworthiness and competitiveness of airports in the capital markets. Although bond insurance is not always viewed as a financial advantage among airport financial managers, fully half the total volume of airport debt issued in the municipal bond market between 1985 and 1995 carried such insurance, a statistic that varied only marginally among different sized airports.⁶

Bond insurance is an important means by which airports can reduce their cost of capital. In return for the payment of insurance premiums (established in relation to the risk profile of the bond issue), airports enjoy bond ratings that equate to the rating of the bond insurer. Other things being equal, the cost of capital for insured bonds is lower than the cost of capital for uninsured bonds, a saving that can exceed the premiums incurred by the airport in order to carry the insurance.

Defaults. As measured by the number of defaults, the investment value and competitiveness of airport securities is especially strong. The airport industry has never suffered a single default.

Regular Participation

Airports are a major and regular participant in the municipal bond market. Between 1985 and 1995 the nation's airports issued more than \$42 billion in revenue and general obligation-backed bonds, rising from \$3.8 billion in 1985 to \$5.5 billion in 1990 and coming in at \$4.3 billion in 1994 (in current dollars). Coupled with their strong financial performance (see above), this regularity gives investors confidence in airports as experienced and sophisticated borrowers.

Although airports of all sizes and types participate in the bond market, larger airports do so to a greater extent than smaller ones and are far more prominent in terms of the dollar-volume of debt issued (Table 2.4). Among the large and medium-sized commercial airports, together serving about 90 percent of all passenger traffic, fully 85 percent -- 56 of 66 airports -- used bond financing for capital investment over the 1985 to 1995 period (up from 58 percent over the 1978 to 1982 time frame)⁷.

⁶ Based on data obtained from Securities Data Company, Inc.

⁷ op. cit. Congressional Budget Office, 1984 and Securities Data Company, Inc.

Many small airports do use bond financing. Indeed, 249 small commercial, reliever and general aviation airports used bond financing over 1985 to 1995 period versus 56 large and medium-sized airports. As a group however small airports participate in the bond market in only a small way. The 249 small airports that participated over the last 10 years represent only seven percent of all public-use airports in that category. Even so, the Federal share of total airport capital expenditure among small airports fell from 69 percent over the 1978 to 1982 time frame to 41 percent over the ten years since 1985 (see Table 2.2) indicating significant growth in the rate of borrowing activity among these airports, as well as declining AIP funding levels since 1993.

TABLE 2.1
AIP Allocations by Program Category for Fiscal
Years 1985 to 1993 and Type of Project
(in billions)

	Allocation	Percent
Primary airports		
Large	\$3.58	32.1
Medium	2.36	21.2
Small	1.38	12.3
Other commercial service airports	0.52	4.7
Reliever airports	1.46	13.1
General aviation airports	<u>1.85</u>	<u>16.5</u>
Total	\$11.15	100.0

Type of Project	Percent
Landing areas, construction of runways	22.1
Landing areas, construction of taxiways	16.4
Landing areas, construction of aprons	13.9
Land, other than for noise control	8.1
Land for noise control	7.3
Safety and security	6.4
Lighting, navigation aids, and weather equipment	5.6
Roadways	5.3
Building, terminals	4.1
Noise control, other than land acquisition	3.5
Miscellaneous	2.5
Planning	1.9
State pilot block grant program	1.7
Building, other	<u>1.2</u>
Total	100.0%

Source: FAA, *Twelfth Annual Report of Accomplishments Under the Airport Improvement Program*, FY 1993.

TABLE 2.2
Contribution of Federal Grants and Debt Finance
to Airport Investment Funds, by Airport Size, 1985-93
(billions of 1994 dollars)

Airport Size	Debt Finance	AIP Funds	Total	Percent Share from AIP
Large	21.7	3.6	25.3	14.2
Medium	6.2	2.4	8.6	27.9
Small	7.5	5.2	12.7	40.9
Total	35.4	11.2	46.6	24.0

Source: The Securities Data Company- Database of Municipal Bond Issues, 1995;
FAA, *AIP Program, Twelfth Annual Report FY 1993*.

Figure 2.1

VOLUME OF AIRPORT MUNICIPAL BOND DEBT CLASSIFIED BY CREDIT RATING, 1985-1995

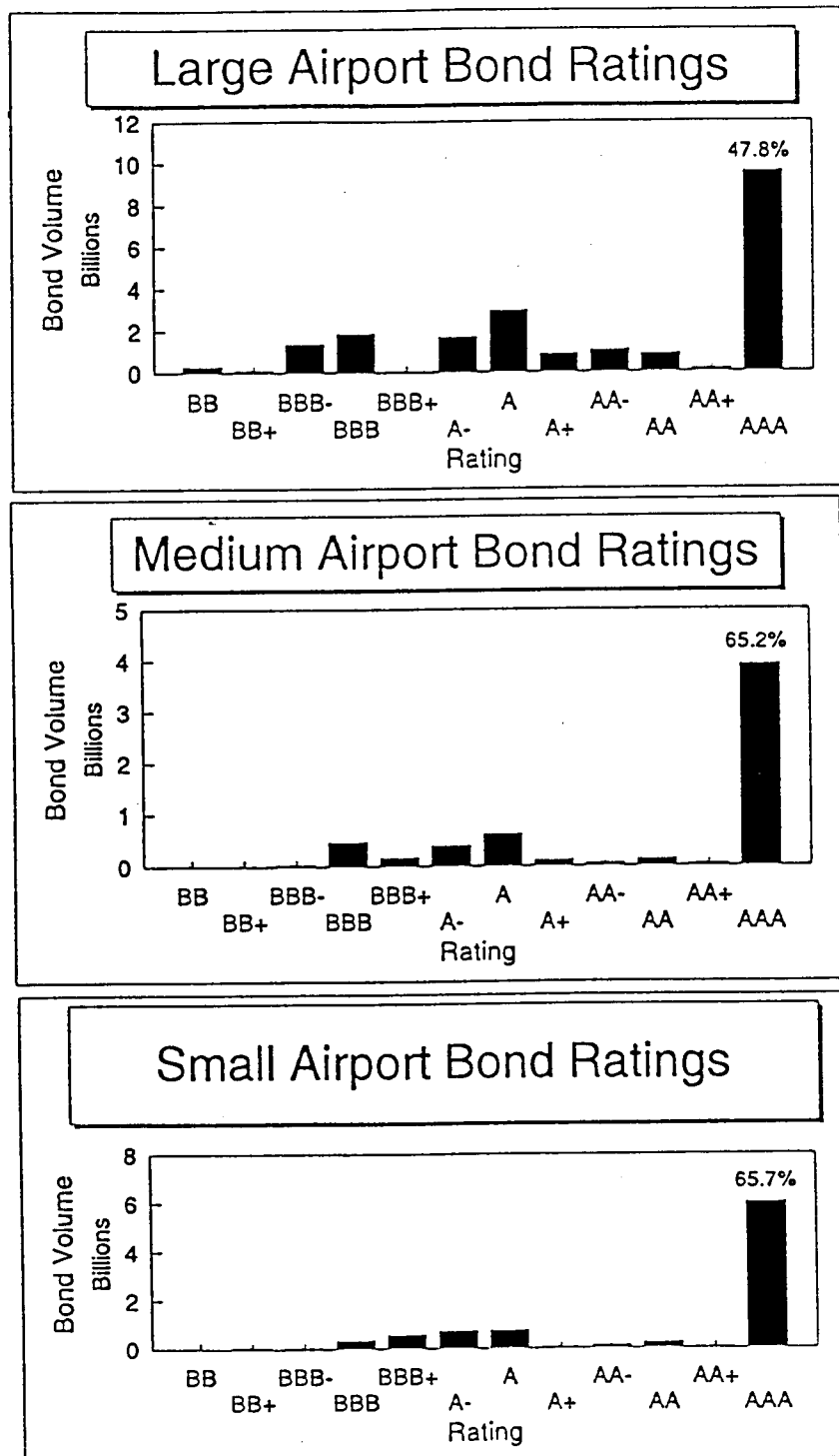


TABLE 2.3
Average Annual Interest Rates Paid on Airport Bonds
and Difference Relative to Other Municipal Issues,
by Size of Airport, 1985-1995

Size	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Large	8.47	6.58	8.20	7.87	7.50	7.40	6.60	6.41	5.43	6.27	5.91
Medium	9.40	8.29	7.66	7.60	7.60	8.17	6.98	6.62	5.60	5.90	5.88
Small and Other 1.	8.85	7.21	7.88	7.70	7.77	7.25	6.72	6.10	4.97	5.68	5.80
Bond Buyer Index	9.18	7.32	7.63	7.68	7.23	7.27	6.92	6.45	5.58	N/A	N/A
Difference from the Bond Buyer Index											
Large	-71	-74	57	19	27	13	-32	-4	-15	N/A	N/A
Medium	22	97	3	-8	37	90	6	17	2	N/A	N/A
Small	-33	-11	25	2	54	-2	-20	-35	-61	N/A	N/A

1. Includes commercial service and general aviation

Sources: Securities Data Company Inc. - Municipal Bond Database, 1995
Statistical Abstract of the United States, 1994

TABLE 2.4
Annual Municipal Bond Debt in Selected Years
and Total 1985-1994 and by Airport Size
(in Millions)

	1985		1990		1994		TOTAL 1985-1994	
Type	\$Millions	Percent	\$Millions	Percent	\$Millions	Percent	\$Millions	Percent
Large	\$2,366	62	\$4,556	82	\$3,047	70	\$26,041	62
Medium	\$867	22	\$200	4	\$623	14	\$7,266	17
Small 1.	\$538	14	\$748	14	\$675	15	\$8,941	21
TOTAL	\$3,771	100	\$5,504	100	\$4,346	100	\$42,247	100

1. Includes commercial service and general aviation

Source: The Securities Data Company - Database of Municipal Bond Issues, 1995

III. INNOVATIVE FEDERAL FINANCING: OPTIONS AND IMPACTS

This Chapter assesses the likely impacts of Federal innovative financing mechanisms on airport finance given the institutional, policy and financial context presented in Chapter II. Five topics are addressed:

1. What feasible options are there for innovative Federal financing of airport capital projects?
2. What magnitude of change in airports' cost of borrowing funds for capital investment would stem from the introduction of innovative financing mechanisms?
3. To what extent would reductions in the cost of capital precipitated by innovative financing mechanisms increase or accelerate airport borrowing for the purpose of capital investment?
4. To what extent would increased or accelerated airport borrowing stimulate the development of *more* needed airport infrastructure versus the *substitution* of debt for other forms of available airport finance (such as state and local grants)? and
5. What is the possibility that options for innovative finance could help diminish airline near term financial constraints that inhibit timely construction of needed airport improvements?

OPTIONS

Reviewed in consultation with over 150 stakeholders in public and private finance and airport management,⁸ the Chapter examines the Federal options for innovative airport finance highlighted in the Congressional report requirement.

Option 1: Use AIP grants to fund debt repayment reserves of airport revenue bond issues.

Option 2: Authorize Federal guarantee of airport loans, analyzed assuming tax-exempt status.

Option 3: AIP eligibility for commercial bond insurance.

⁸ Consultation regarding federal options for innovative airport financing was facilitated in a two-day Workshop conducted by the FAA on February 1-2, 1995. The options are reported in, John A. Volpe National Transportation Systems Center, *Innovative Financing of Airport Development*, March 10, 1995.

Option 4: Institute an airport loan fund.

A number of these options would require new legislative authority or new regulations, as well as new administrative procedure. As discussed later in this Chapter, the cost of administration must be taken into account in gauging the overall cost-effectiveness of each option.

Option 1: Use AIP Grants to Fund Debt Repayment Reserves of Airport Revenue Bond Issues

This option would allow airports to use a designated portion of their Airport Improvement Program grants to establish debt service reserves. As shown in Chapter 2, debt service reserves represent the safety margins needed to give lenders the assurance that airport borrowers can withstand temporary revenue shortfalls without impairing their ability meet scheduled debt repayments.

This use of AIP funds would enable airports to curtail the practice of borrowing additional funds at the time of a bond issue in order to establish the requisite debt service reserve fund. However, this use of AIP funds must be structured so that grants could not be used to guarantee, directly or indirectly, tax-exempt airport debt. In particular, the use of AIP funds to establish a reserve fund for a debt issue should be structured in a manner such that any reserve funds not drawn down as a consequence of a financial emergency would revert to the issuer rather than be used to redeem bonds.

Option 2: Federal Guarantee of Airport Loans

This option would authorize the Secretary of Transportation to guarantee the payment of principal and interest of debt issued by airports, provided that the proceeds of such debt were used to finance qualified airport improvement projects. Consistent with Federal credit program policy, the guarantees would be targeted at those borrowers who are unable to borrow on reasonable terms and conditions, but who also provide a reasonable assurance of repayment. The guarantee should be limited to no more than 80 percent of outstanding principal and interest, in order to provide an incentive for lenders to scrutinize the creditworthiness of borrowers and to reduce Federal payments in the event of default. Further, consistent with the Federal Credit Reform Act of 1990, the Secretary of Transportation could make commitments to guarantee obligations only to the extent that appropriations of budget authority to cover subsidy costs were provided in advance in appropriations Acts.

An obstacle to the application of this option is that Federal law provides that the interest on an obligation which is directly or indirectly guaranteed by the United States, with certain exceptions, is not exempt from Federal income taxation. Therefore, absent a change in Federal tax law, only taxable airport bonds could be guaranteed under this option. While a Federal

guarantee would allow airports to issue taxable bonds at lower interest rates than without a guarantee, it must also be considered that investors demand higher interest rates on taxable bonds than on tax-exempt bonds, all other things being equal. It is likely that the net result would be to increase the borrowing costs of most airports.

Because of this net result, this report has estimated the effect on airport financing assuming that Federal law were amended to allow airport bonds which were Federally guaranteed to retain their tax-exempt status. However, it must be emphasized that the Administration would strongly oppose such a proposal because of its other effects. The U.S. Treasury is prohibited from directly issuing obligations exempt from Federal income taxation. Federal guarantees of airport bonds would create securities which are superior to direct obligations issued by the Treasury. Federal guarantees of tax-exempt securities also have adverse effects on the municipal market, because they create securities which are superior to all other tax-exempt securities issued by state and local entities. Furthermore, a guarantee of a tax-exempt obligation is an inefficient means of providing Federal assistance because the revenue loss to the Treasury exceeds the interest benefits to the borrower. There is also the problem that granting an exception for airport bonds would lead to pressure by interested parties seeking exceptions for other types of tax-exempt debt.

Option 3: AIP Eligibility for Commercial Bond Insurance

A variant of Option 2, this approach would assist airports that cannot afford or qualify for bond insurance. Under one approach such airports would be permitted to purchase commercial bond insurance with AIP funds. This option would have to be implemented in a manner that ensures that the holders of such bonds would have no recourse to the Federal Government in the event of default by the issuer of the bond and insolvency of the bond insurer.

Option 4: An Airport Loan Fund

This option would establish an airport improvement loan program, using appropriations from the Airport and Airways Trust Fund to cover subsidy costs, as defined in the Federal Credit Reform Act of 1990. Although various approaches to the administration of such a program are possible, most foresee it lending directly to airports at rates comparable to those in the insured tax-exempt bond market. Consistent with Federal credit program policy, Federal loans should be available only to those airports unable to borrow on reasonable terms and conditions, but are also able to provide a reasonable assurance of repayment. Most airports, therefore, would not be eligible for this type of Federal assistance.

IMPACT OF INNOVATIVE FINANCING OPTIONS ON THE COST OF CAPITAL

A general forecasting framework, a range of quantitative assumptions, and a specific forecasting model for each option lie at the heart of the estimates presented here.

The Forecasting Framework

Figures 3.1 and 3.2 present in diagrammatic form the detailed analytic framework within which the study estimates the quantitative effects of new financing arrangements on airports' cost of capital. The top row of boxes in each diagram depicts the causal factors in the determination of credit ratings (Figure 3.1) and interest costs (Figure 3.2). The second row depicts the quantitative significance of each factor in bringing about change in creditworthiness or interest costs. Some factors are obviously quantitatively more significant than others and the second row of the framework takes this into account.

This framework is designed to mirror the institutional, policy and financial realities of the capital markets and the position of airports in those markets, as described in the previous Chapter. To ensure that the framework represents a truly realistic portrayal of the marketplace it was exposed to a panel of financial experts and airport managers and adjusted to accommodate their views. The framework was then translated into a computer simulation program for use in analyzing the effects of each option. The participants in this panel are listed in Appendix C.

The structure of Figures 3.1 and 3.2 reveals that credit ratings represent one of several factors upon which interest costs ultimately turn and that some of these other factors also figure into the determination of credit ratings. Credit ratings are in fact both a cause of interest costs and an *effect*, since outstanding bonds are periodically reviewed and their ratings adjusted to reflect changed economic, financial and other market circumstances, circumstances which are likely to be reflected **already** through changes in the market price at which the bonds trade.

Quantitative Assumptions

Any particular innovative financing option will affect airport borrowing costs through one or more of the factors that cause credit ratings and interest costs to change, namely those factors in the top row of boxes in Figures 3.1 and 3.2. Since the size of the impact will depend upon the *quantitative significance* of each factor in bringing about change (the second row in the diagram) this study quantified the significance of such impacts. This was achieved in two steps. The first was a detailed econometric analysis of credit ratings and the interest costs and the translation of this analysis into a probability range of possible values for each factor. The second step exposed

these ranges to the panel of experts and managers (see Appendix C) who adjusted the estimates in light of their field experience.

Details of the econometric analysis are presented in Appendices F (for credit ratings) and E (for interest costs) and the results are summarized in Tables 3.1 and 3.2. As shown in Table 3.1, the use of debt guarantees such as bond insurance and letters of credit have a material, positive influence on bond ratings whereas the use of airport revenues in lieu of the tax base to secure the bonds has a material, negative influence. For small airports, credit ratings tend to improve somewhat for relatively larger issues.

Although Figure 3.1 indicates that a number of other factors influence bond ratings, the four factors identified in the econometric analysis together account for more than 75 percent of the variation in ratings from airport to airport (see Appendix E).

The eight factors shown in Table 3.2 account for 80 percent of the variation in interest costs among airports (see Appendix F). Clearly a most significant factor for airports is their access to the *tax exempt* municipal bond market.⁹ That factor alone, everything else remaining equal, reduces borrowing costs by an estimated 187 basis points (1.87 percentage points) for large airports; 139 basis points for medium-sized airports; and 167 basis points for small airports. Any innovative financing mechanism that involved the elimination of this Federal tax expenditure could cause airport interest costs to rise rather than fall.

A full increment improvement in bond rating has a measurable but moderate impact on interest costs, about 20 basis points (one-fifth of a percentage point). Of greater importance is movement in municipal bond rates generally (themselves a reflection of general economic conditions and fiscal and monetary policy). For large airports, the use of bond insurance has about the same impact as a one increment improvement in credit rating whereas the importance of bond insurance outweighs improved credit ratings for medium-sized and small airports.

Consensus Model and Assumptions for Each Option

As indicated above, the quantitative estimates were presented to the panel of experts along with probability ranges for each to account for uncertainty. The panelists were also asked to review the way in which the study team proposed to forecast the effects of each innovative financing mechanism through the forecasting framework (the forecasting "model" for each option). What emerged was a consensus regarding the appropriate model and quantitative assumption for each

⁹ Although use of a letter of credit appears to have an equal or greater effect than the tax exemption, it must be recognized that such an instrument is germane only for very small borrowings and are used in less than five percent (in dollar-volume) of airport loans or bond issues.

option. The consensus model and assumptions, including the probability ranges, are presented for each option in Appendix D.

Projected Impacts and Risk Analysis

Based on the model and assumptions reported in Appendix F, Table 3.3 presents the projected impacts of each innovative financing mechanism on airport interest costs (cost of capital). The projected impacts are reported in the form of the expected percentage change in interest costs; thus a 1.93 percent reduction in interest costs of large airports due to Option 2 (Federal airport loan guarantees) means that an 8 percent interest rate would fall to 7.85 percent -- the appropriate calculation is $8.0 \times [1 - 0.0193]$.

From the perspective of large and medium-sized airports, the impacts reported in Table 3.3 are modest but not insignificant. For a large airport issuing bonds worth, say, \$113 million (the 1985 to 1993 average-sized issue for these airports) at 5.91 percent interest (the prevailing rate in early 1995, see Table 2.3), the interest expense would be \$6.68 million. Option 2 (Federal Guarantees of Airport Debt) would reduce interest expenses by an estimated 1.93 percent, or \$124,300 on the average-sized bond issue in 1995. If airports were to leverage such a sum by using the interest cost saving to fund added debt service, an extra \$2.14 million would actually be available for construction and related purposes.¹⁰ Although this amount represents a small percentage of the total cost of a new runway (about \$100 million), taxiway (about \$60 million) or terminal modernization (about \$50 million), it is meaningful in relation to the cost of collateral opportunities to enhance the effectiveness and local acceptability of such investments such as advanced runway lighting systems and noise mitigation. Alternatively, these saving could be passed along to reduce the costs to airport users.

From a small airport perspective, projected impacts are proportionately more significant. The provision of Federal Guarantees of Airport Debt (Table 3.3, Option 2) for example would shave an estimated 5.85 percent off the debt service bill for a small airport participating in the bond market. For an airport disseminating the average-sized bond (\$16 million 1995) at interest rates prevailing in early 1995, this saving could be leveraged into an additional \$994,000.¹¹ For a

¹⁰ The interest rate reduction of 1.93% reduces the effective interest rate from 5.91% to 5.80%. On an average sized bond (\$113 million in 1995) the lower rate yields savings in debt service of \$124,300 i.e., $(\$113 \text{ million} \times 5.91\%) \text{ minus } (\$113 \text{ million} \times 5.80\%) = \$124,300$. If this amount were to be used to fund additional debt service at the lower interest rate, the airport could leverage the savings into \$2.14 million of additional borrowing $(\$124,300 / 5.80\% = \$2.14 \text{ million})$.

¹¹ The interest rate reduction of 5.85 percent reduces the effective interest rate from 5.80 percent to 5.46 percent. On an average sized bond (\$16 million in 1995) the lower

small commercial airport such a sum is large enough to influence the scope of a project (the size of a terminal building expansion, for example).

Like all forecasts, those reported in Appendix F are uncertain. To determine whether a significant risk exists that the estimates substantially under-state the prospective impact of innovative financing mechanisms, Appendix D reports the range of possible outcomes in light of the probability ranges associated with each of the estimating assumptions.¹² A review of the results in Appendix D indicates that the probability of any significant departure from the central estimates reported in Table 3.3 is extremely small. Since the probability ranges upon which the risk analysis is based represent a consensus view among industry experts and managers, these results may be interpreted as a consensus as well.

IMPACT OF INNOVATIVE FINANCING OPTIONS ON AIRPORT BORROWING FOR CAPITAL INVESTMENT

Figure 3.3 presents the framework within which forecasts have been developed of the volume of enhanced borrowing activity likely to stem from the cost of capital reductions discussed in the section above. Like the previous forecasting framework, Figure 3.3 represents a consensus view of industry experts and managers. In essence, the framework states that airport borrowing will increase by some percentage amount in response to each one percent reduction in the cost of capital (a relationship known in economic vernacular as an "elasticity").

What then is the elasticity of airport borrowing with respect to interest costs? The econometric analysis reported in Appendix G indicates that over the period 1985 to 1995, each one percent reduction in interest cost leads to a 1.6 percent increase in the volume of bonding activity among large and medium-sized airports and virtually no measurable impact on the volume of bonding activity by small airports.

However, since a sizable proportion of bonding activity represents the re-financing of outstanding debt rather than the issuance of bonds for new construction or repair activity, the

rate yields savings in debt service of \$54,288.00 (\$16 million x 5.46 percent) minus (\$16 million x 5.46 percent) = \$156,940. If this amount were to be used to fund additional debt service at the lower interest rate, the airport could leverage the savings into \$994,285 of additional borrowing ($\$54,288 / 5.46\% = \$994,285$). This is approximately 6.2 percent of the average size bond ($\$994,285 / \$16 \text{ million} = 6.2\%$).

¹² The technique of "Monte Carlo simulation" was used to vibrate all assumptions simultaneously according to their estimated probability distributions so as to produce the probability distribution for the final outcome.

estimates reported in Appendix G represent the most that can be expected in the way of new airport development in response to reduced interest costs.

Using the elasticity estimates reported above, Table 3.3 presents the estimated impact of reduced interest costs on airport bonding activity, recognizing that the impact on *capital investment* will be smaller. For large airports, the results range from 0.41 percent (Option 1) to 3.05 percent (Option 2). For medium-sized airports the results range from 0.14 percent under Option 1 to 2.91 percent under Option 2.

For small airports, bonding activity is estimated to increase by less than one percent under all options. Participating far less frequently and on a smaller scale simply by virtue of their size, smaller airports do not have the same financial incentives to fine tune the timing of their entry into the market, as do larger airports.

To put these results in perspective, large and medium airports invested \$33.3 billion in infrastructure from January 1985 through June of 1995. Option 2 (Federal Guarantees of Airport Debt), is estimated to cause a 3.05 percent maximum increase in bonding activity for large airports and a 2.91 percent increase for medium-sized airports. Thus this increased use of the bond market would have resulted in \$52.7 million of additional bonding activity in 1995.¹³

The impacts projected above are drawn from statistical models of system-wide impacts and mask potentially larger effects in local situations where factors such as airline financial restraint or local government bonding restrictions delay worthwhile projects or diminish their scope. Although the powerful Federal role and mature airport investment market revealed earlier create a healthy environment for airport investment, it was also shown that the environment is not entirely fluid with respect to changing investment opportunities and economic needs. At large and medium-sized airports, where major airlines exert significant influence over the scope and timing of investment, near-term financial realities facing airline management can create divergent airport-airline perspectives on the appropriate timing and scope of capital improvements due to their immediate implications for landing fees and other airline costs. Although this study uncovered no evidence of systemic development constraints at large and medium-sized airports, local situations are known to arise in which *economically* worthwhile investment initiatives (such as congestion and noise-reducing projects) are delayed or scaled back for *financial* considerations.

While there is always a risk that interest rate subsidy can induce excessive capital spending - i.e., projects that would not pass a rigorous market test of merit, it is known that airline financial constraints can and do diminish the scope of worthwhile investments at large and medium-sized

¹³ The calculation assumes (\$1.32 billion in large airport bonds in 1995 * 3.05%) + (\$427 million in medium airport bonds in 1995 * 2.91%) = **\$52.7 million** of additional bonds in 1995.

airports or put them on hold, sometimes for years. Although the dollar-volume of worthwhile airport investment that is foregone or delayed due to such conflicts is unknown, innovative financing mechanisms that were *carefully targeted* in relation to such cases could help alleviate investment bottlenecks.

IMPACT OF INNOVATIVE FINANCING OPTIONS ON NET AIRPORT DEVELOPMENT

To the extent that airport borrowing activity is projected to rise as a result of Federal innovative financing mechanisms, it is important to ask whether the funds would be used in lieu of other available sources of capital (bond finance and state and local grants, principally) or for net new additions to airport infrastructure. The econometric benchmarking analysis reported in Appendix H and summarized below indicates that in the case of small airports innovative financing mechanisms are quite likely to yield net new additions to airside and terminal capacity.

For large and medium-sized airports the benchmarking analysis indicates that, since such airports face no systemic obstacles to obtaining investment capital, interest rate relief through innovative financing mechanisms creates a risk of substituting for otherwise available capital dollars. On the other hand, the fact that some large and medium-sized airports face delays and scope reductions in economically worthwhile investments due to airline financial pressures, targeted applications of innovative financing mechanisms would likely generate investment that would otherwise be deferred, cut-back or canceled.

Benchmarking Analysis

While many airport authorities face significant environmental and land-use development constraints, sound balance sheets and access to debt capital enable the nation's largest airports to fund capital investment without encountering serious or systematic financial constraints in the capital markets. Airports sometimes face opposition to capital projects from airlines on financial grounds and such opposition can delay or even annul publicly desirable projects (projects whose *economic* benefits exceed their costs).¹⁴ Obstacles to investment also arise in the form of local environmental, noise and land-use considerations. However, once airline and local project approvals are obtained, large airports do not face constraints to securing bond finance in the capital markets. This means that larger airports can be taken as a rough benchmark against which to evaluate the magnitude and nature of any financial constraints facing the nation's smaller airports.

¹⁴ Helping airports overcome such barriers to moving ahead with economically worthwhile projects is one goal of the AIP.

Econometric analysis of airside capital spending (principally runways, taxiways and aprons) by large and medium-sized airports between 1986 and 1994 (Appendix H) reveals that each one percent growth in aircraft operations (take-offs and landings) led large airports to respond with 0.97 percent more investment in airside facilities (including the use AIP funds). The corresponding "growth-investment rate" for landside investment among large and medium-sized airports (terminals, parking lots, roads and so on) was 1.0 over the 1986-1994 period (in relation to growth in passenger enplanements).

For airside investment at small airports, the statistical analysis reveals a growth-investment rate of 0.72 versus 0.97 for large airports. However, statistical tests indicate that these two values lie within the same 95 percent statistical range.¹⁵ The analysis thus reveals *possible* but weak evidence of a financial constraint to airside development among smaller airports. This inconclusive finding is consistent with accounts given in Chapter II where it is shown that small airports can raise needed capital for runway and taxiway development through the sale of bonds but that they participate in the capital markets far less intensively than larger airports.

It must be recognized that the results reported above represent long-run outcomes for large groups of airports. Since airline and local government financial constraints can delay or reduce the scope of needed airport investment projects at a given point in time, these results almost certainly mask local situations in which financial constraints to airport investment are very real.

For landside projects, however, another story emerges even with regard to long-run outcomes at small airports. In this category of investment, smaller airports display a growth-investment rate of 0.78 versus 1.0 for larger airports and the statistical analysis reveals that these values do not fall within the same statistical range. This finding indicates that smaller airports categorically do face long-run, systemic financial constraints to engaging in their desired level of landside investment in response to aviation growth.

¹⁵ Based on a "Chow Test" of structural change. See Appendix H.

Figure 3.1: Framework for Simulating Impact of Innovative Financing Options on Credit Ratings

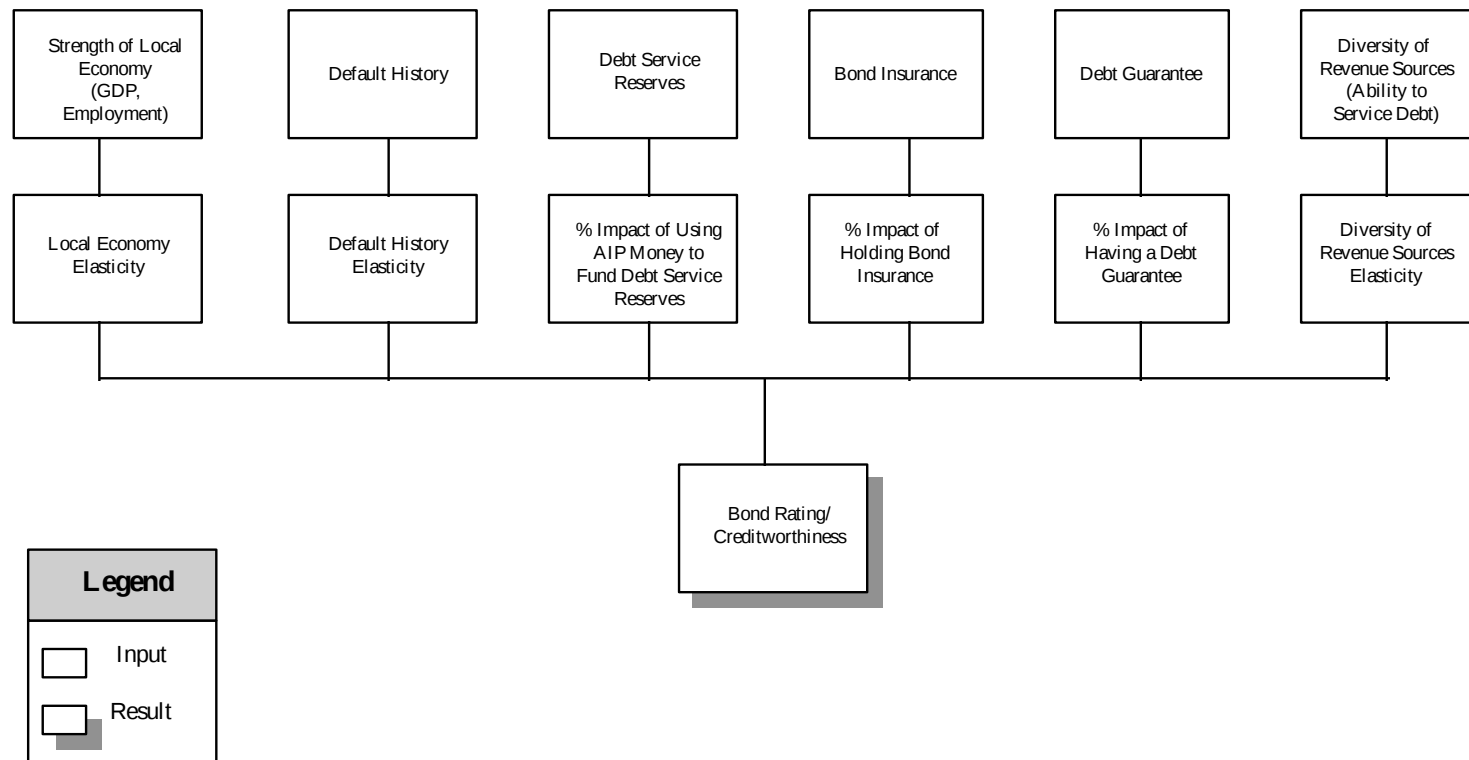


Figure 3.1: Continued

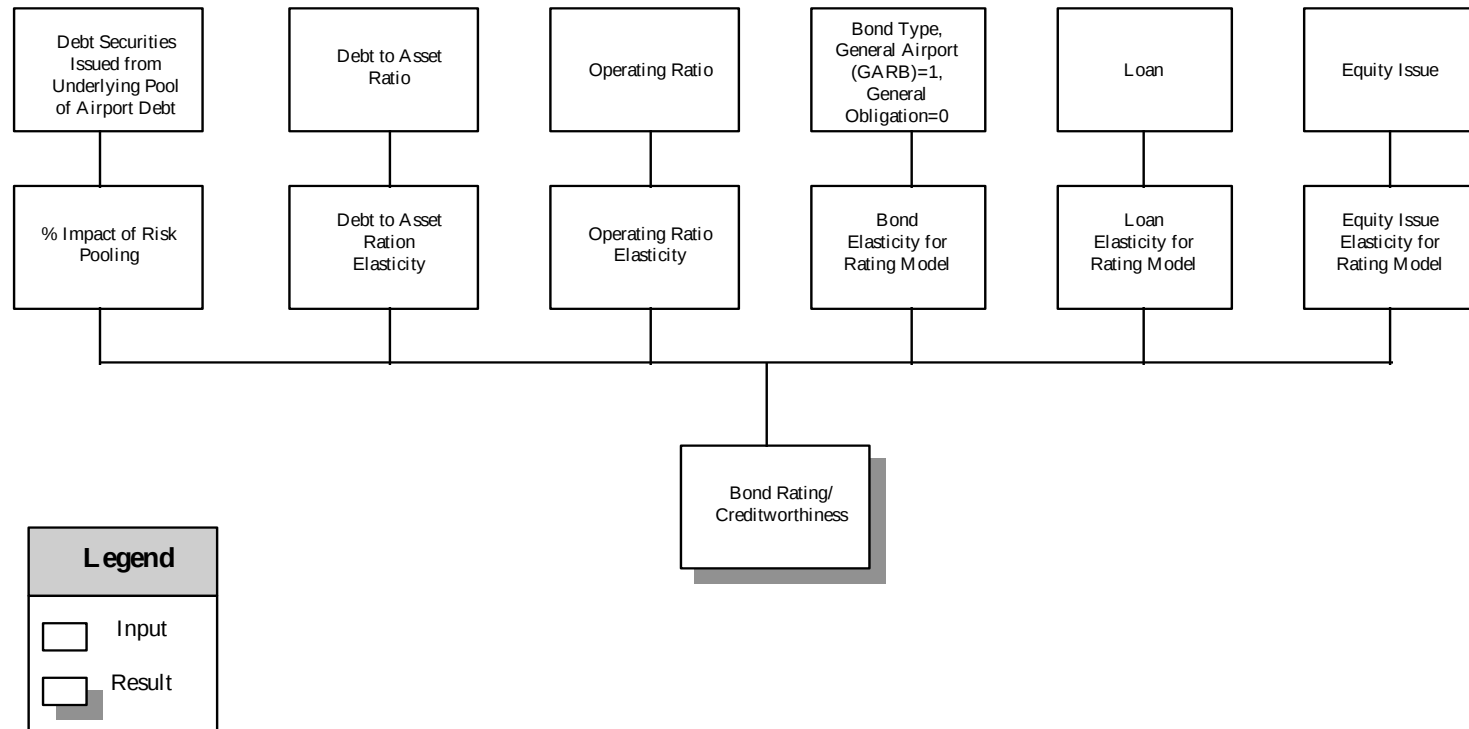


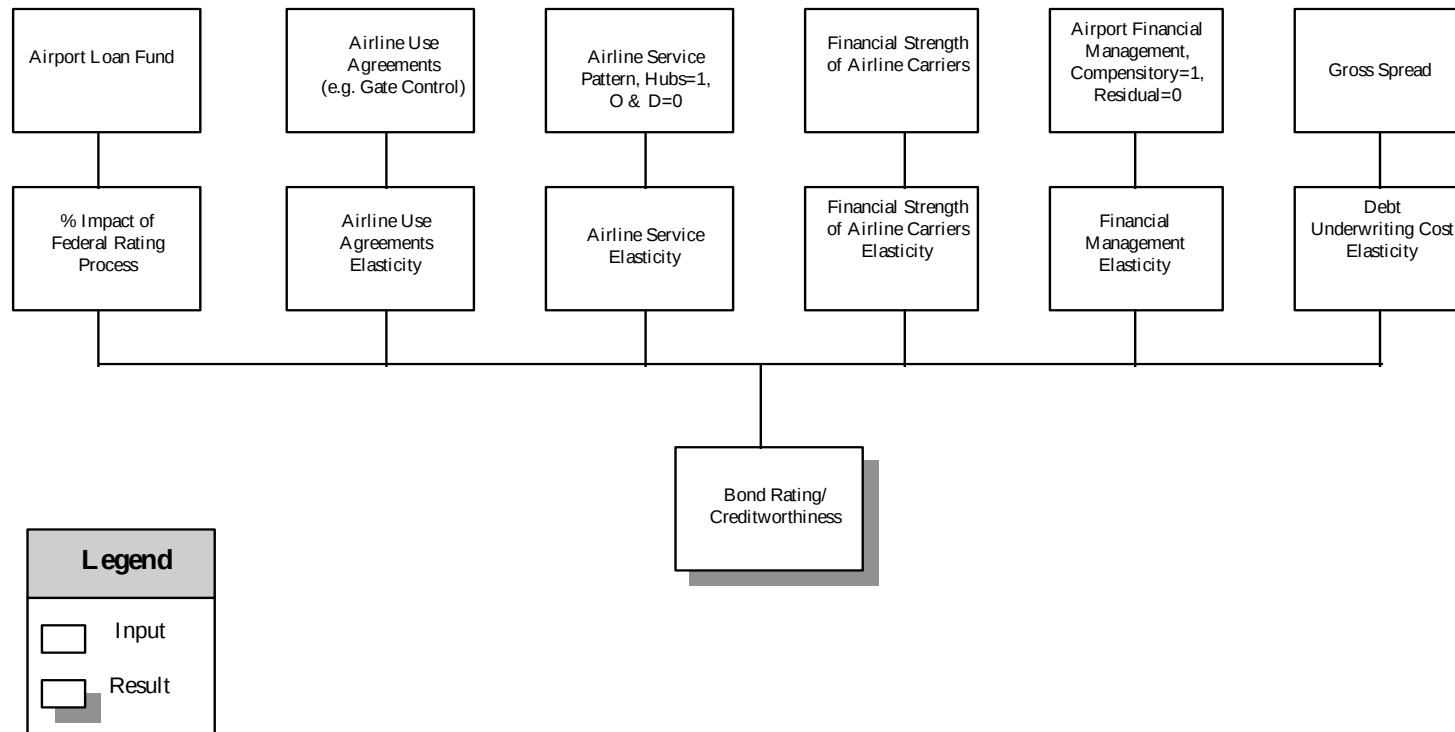
Figure 3.1: Continued

Figure 3.2: Framework for Simulating Impact of Innovative Financing Options on Cost of Capital

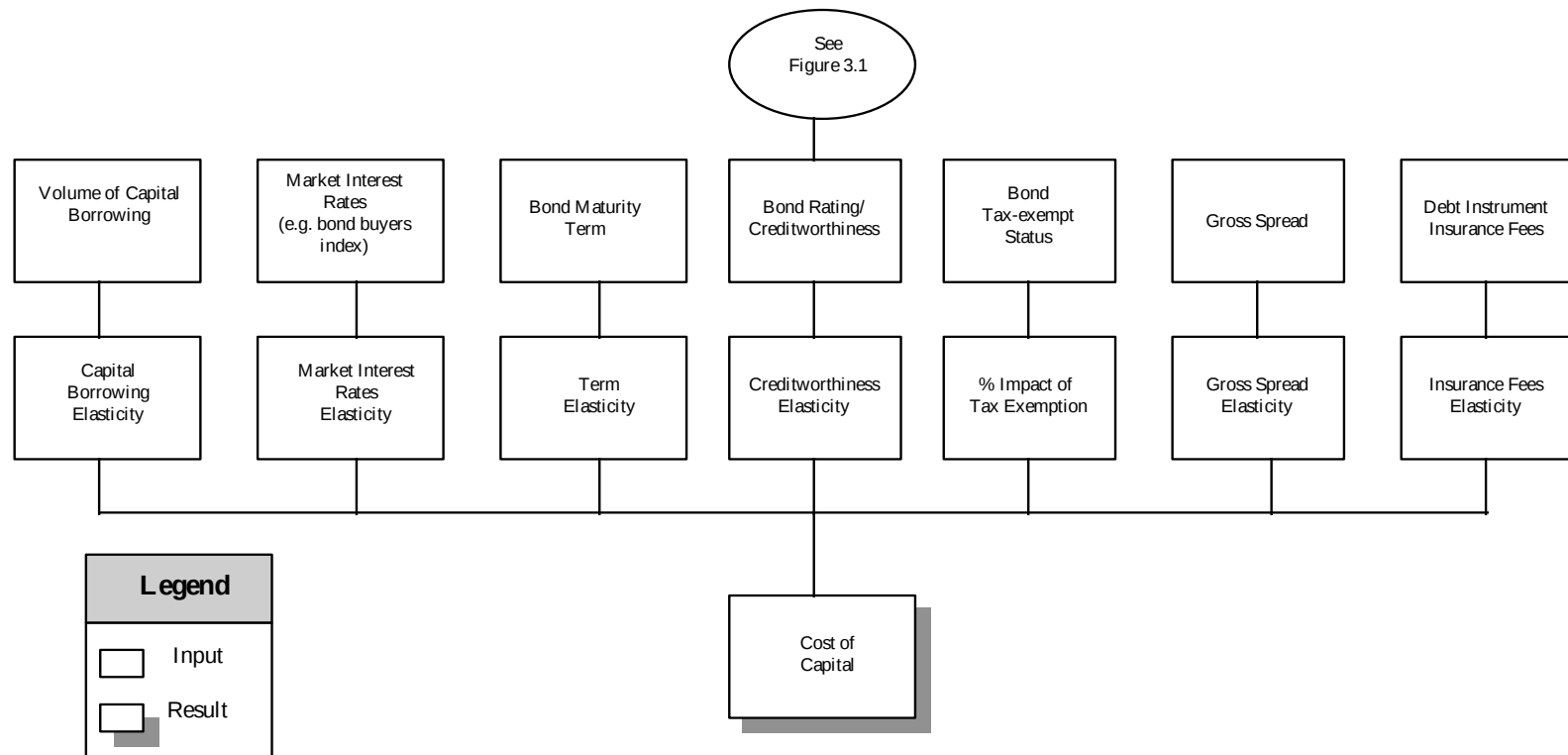
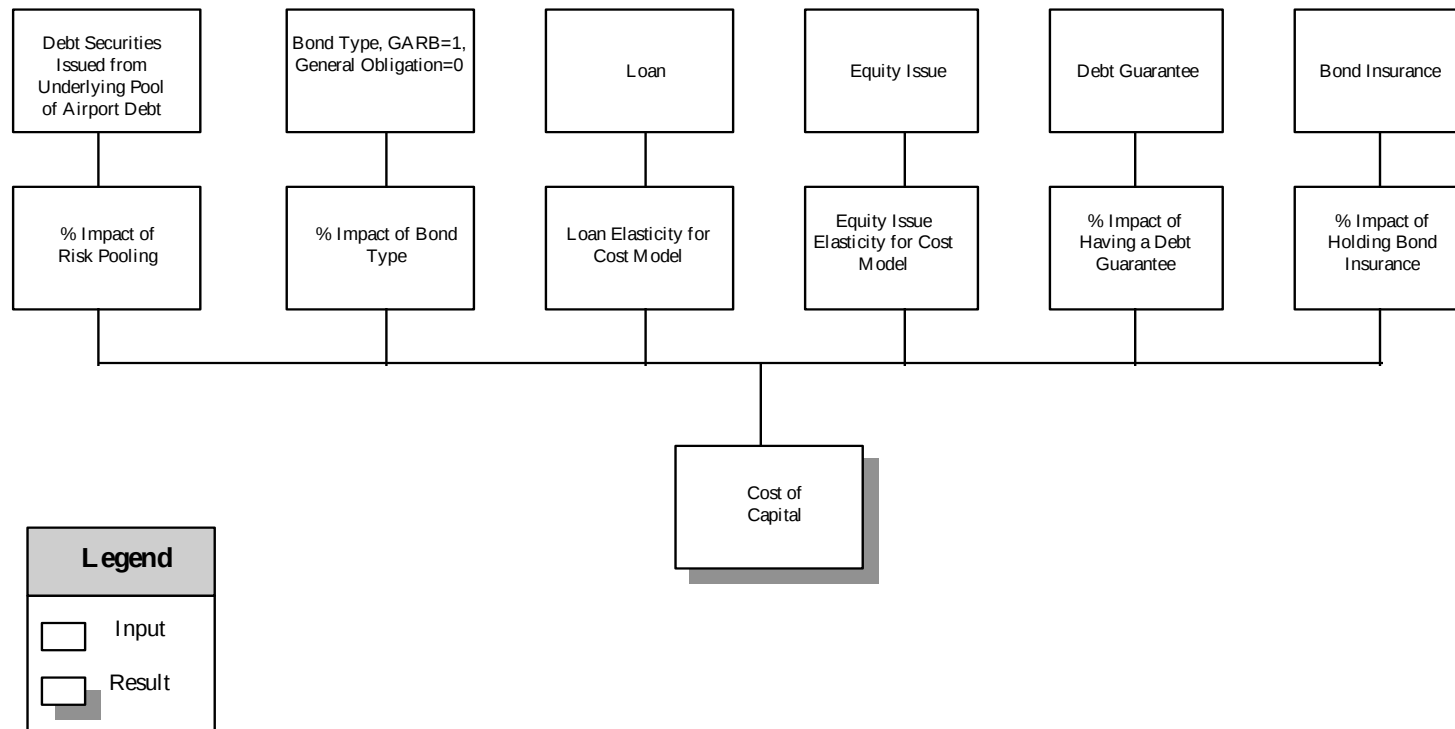


Figure 3.2: Continued



**TABLE 3.1: Estimated Impact of Market Factors on Airport Credit Ratings
by Size of Airport; 1985 - 1995**

Factor	Change in Credit Rating Due to Factor		
	Large Airports	Medium Airports	Small Airports
A 10 Percent Increase in the Size of Bond Issue (For Example)	No Impact	No Impact	Improve by Less than One Increment (e.g., A- to A)
Bond Insurance	Improve by One Increment (e.g., A to AA)	Improve by One Increment (e.g., A to AA)	Improve by One Increment (e.g., A to AA)
Letter of Credit	Improve by One Increment (e.g., A to AA)	Improve by One Increment (e.g., A to AA)	Improve by One Increment (e.g., A to AA)
Revenue Bond versus General Obligation Bond	Decline by One Increment (e.g., A to BBB)	Decline by One Increment (e.g., A to BBB)	Decline by Less than One Increment (e.g., A to A-)

Source: Econometric analysis reported in Appendix E.

TABLE 3.2: Estimated Impact of Market Factors on Airport Cost of Debt Capital by Size of Airport; 1985 - 1995

Factor	Change in Basis Points ¹ Due to Factor		
	Large Airports	Medium Airports	Small Airports
A 10 Percent Increase in General Market Interest Rates	+ 82	+ 82	+ 105
A 10 Percent Increase in the Number of Years to Maturity	+ 11	+ 5	+ 9
A 10 Percent Increase in the Size of Bond Issue	- 2	No Impact	No Impact
A One Increment Improvement in Credit Rating (e.g., A to AA)	- 20	- 8	- 16
Tax-Exempt Status	- 187	- 139	- 167
Bond Insurance	- 23	- 47	- 67
Letter of Credit ²	- 183	- 201	- 138
Revenue Bond versus General Obligation Bond	+ 31	+ 81	+ 52

^{1.} An interest rate of 8.0 per cent is assumed.

^{2.} Used in less than five percent of all airport bond issues.

Note: One basis point is equivalent to a hundredth of a percentage point.

Source: Econometric analysis reported in Appendix F.

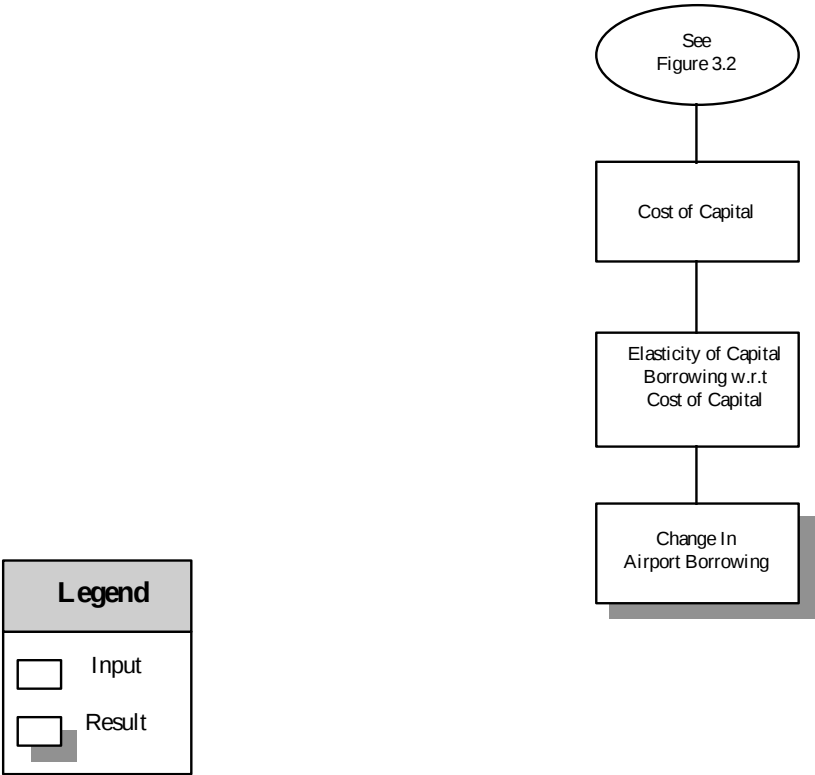
Table 3.3: Impact of Innovative Financing Options

Option	Impact on cost of capital, In Percent			Impact on Airport Capital Borrowing In Percent		
	Large Airports	Mid-sized Airports	Small Airports	Large Airports	Mid-sized Airports	Small Airports
1. AIP Funded Debt Service Reserve	-0.26	-0.09	-0.34	0.41	0.14	< 1.00
2. Federal Guarantee for Airport Loans *	-1.93	-1.78	-5.85	3.05	2.91	< 1.00
3. AIP Funded Bond Insurance	-1.54	-1.60	-5.51	2.42	2.62	< 1.00
4. Establish Airport Loan Fund	-0.96	-0.78	-0.97	1.52	1.28	< 1.00

* Statistical results assume that airport debt receives a Federal guarantee and retains its tax-exempt status. However, it is a long-standing

Federal policy, as well as law, to prohibit any security that receives a Federal guarantee from also retaining tax-exempt status.

Figure 3.3: Framework for Simulating Impact of Cost of Capital on Airport Borrowing



IV. INNOVATIVE FINANCING FOR AIRPORTS IN THE CONTEXT OF FEDERAL FISCAL RESTRAINT

A great many Federal programs are coming under inevitable pressure as the Administration and the Congress forge plans to eliminate the Federal deficit. While large and medium-sized airports draw less than 14 percent of their investment capital from the formula component of the AIP program, discretionary grants frequently account for 25 percent or more of a project's total capital cost. Small airports moreover draw more than 40 percent of their investment capital from Federal grants.

Innovative financing mechanisms could serve the aim of diminishing the risk of system-wide abatement in the rate at which airports keep pace with aviation requirements in the face of fiscal restraint. Compared to grants, innovative "leveraging" options may create a smaller Federal budget liability, because only the actuarial risk of loan loss (if any) is "scored" as a budget "outlay". At the same time, by insulating airlines from some of the burden created by diminished grants, such innovative Federal financing mechanisms could help airports keep up with their capital requirements.

Which mechanisms are likely to promote the aims of innovative financing most cost-effectively? Table 4.1 provides a comparison among the four mechanisms examined in this study. Taking together considerations of effectiveness, complexity and administrative cost, the use of AIP funds to pay for commercial bond insurance offers the most promise. These mechanisms score especially highly in relation to small airports, doubtless the most vulnerable airport sector from the perspective of capital shortfalls.

Table 4.1: Ranking of Innovative Financing Options

	Impact on Capital Investment (Ranking; "1" denotes highest)			Complexity in Implementation	Administrative Cost
	Large Airports	Medium Airports	Small Airports		
AIP Funded Debt Service Reserve	4	4	4	Negligible	Negligible
Federal Guarantee for Airport Loans	1	1	1	Highly Complex Due to Current Tax Code	Relatively Low
AIP Funded Bond Insurance	2	2	2	Negligible	Negligible
Establish Airport Loan Fund (Conservative Fund Management)	3	3	3	Complex	Significant Start Up, Moderate On-going Costs

V. CONCLUSION

While other specific innovative financing alternatives could usefully be examined, the appropriate packaging and design of any innovative financing program would depend upon the budgetary status of the AIP program.

Under current AIP program levels, innovative financing mechanisms would need to be carefully targeted in order to avoid the substitution of Federal dollars for capital dollars available from non-Federal sources. Targeting might give special weight to small airports, which face growing state and local fiscal restraint in addition to limited access in the capital markets; yet some large and medium-sized airports also face constraints, albeit those imposed by the financial condition of major airlines.

On the other hand, if future funding levels for the AIP program were significantly reduced, a more generally available innovative financing program would be suitable and perhaps necessary to help sustain required airport development.

Today's Federal budget realities dictate the consideration of a wide range of options for change, including FAA reorganization, and financing reform. In this context of rapidly developing ideas for Federal deficit reduction, the Administration is proposing, as part of its AIP reauthorization bill, a two part follow up to this study. First, the Administration proposes the formation of a select panel, drawn from the aviation, financial, and local government communities with an interest in airport development. The panel will be charged with assessing the widest possible range of mechanisms to finance airport development, including modifications to the Passenger Facility Charge program, public/private partnerships, and the creation of new financial institutions and techniques. The Administration's second proposal provides statutory authority for the FAA Administrator to test and evaluate the effects on airport development of innovative financing proposals involving AIP funds. Proposals thus tested which are found to provide greater leveraging for Federal dollars and have a positive effect on investment in airport infrastructure would provide a basis for future legislative proposals to further broaden airport development financing options.