

PROPOSED UNIDROIT CONVENTION ON INTERNATIONAL INTERESTS
IN MOBILE EQUIPMENT

AS APPLICABLE TO AIRCRAFT EQUIPMENT THROUGH THE

AIRCRAFT EQUIPMENT PROTOCOL:

ECONOMIC IMPACT ASSESSMENT

A Study Prepared Under the Auspices of INSEAD and the New York University
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Executive Summary

Economic Benefit

The proposed Unidroit Convention on International Interests in Mobile Equipment, as modified by the Aircraft Equipment Protocol thereto (proposed "**Convention/Aircraft Protocol**"), to the extent adopted and effectively implemented, will achieve significant economic gains. These gains will be widely shared among airlines and manufacturers, their employees, suppliers, shareholders and customers, and the national economies in which they are located.

The economic gains will be substantial and complementary. On conservative assumptions, the gains are estimated at several billion U.S. dollars on an annual basis. Such gains are the foundation for promoting any durable legal innovation capable of attracting strong, broad-based international support.

Source of Economic Benefits

Asset-based financing and leasing are efficient forms of credit extension in which prompt recourse to the value of underlying assets (e.g., aircraft equipment) is a central feature in the analysis of overall risk in transactions. National legal rules which are inconsistent with the general principles underlying these transaction types impose costs: financing is comparatively more costly or, where excessive risk is present, unavailable.

The proposed Convention/Aircraft Protocol will reduce risk applicable to these transaction types by establishing an international legal framework - backed by treaty relations and where necessary implementing domestic laws - embodying principles promoting asset-based financing and leasing. This risk reduction will increase the availability and reduce the cost of aviation credit, thus broadening the spectrum of financing alternatives available to users of aircraft equipment.

Moreover, there is a linkage between such legal improvements, static and dynamic efficiency in national and global markets and funds flow, and other tangible micro-and macroeconomic gains, including potential reductions of sovereign debt levels. This linkage is acute and direct given the particular nature of aviation: a capital-intensive industry that is both highly dependent on external financing and has significant spillover effects on national economies and the global economic system.

Categories of Economic Benefit

The study describes and attempts to quantify various categories of economic benefit related to effective implementation of the proposed Convention/Aircraft Protocol.

The categories of microeconomic benefits include benefits to:

- airlines* - through reduced financing costs and enhanced access to funds and funding sources, reduced transaction costs, increased operating efficiency and improved profitability;
- passengers and other end-users* - by means of pass-through price reductions and increased levels of service;
- governments* - through reduced debt levels to governments whose credit - in the form of sovereign guarantees or national airline debt - is used to finance aircraft acquisitions, and risk reductions to governments providing export credit supporting aircraft sales, as well as enhanced privatization potential, where applicable;
- commercial aircraft manufacturers and their suppliers* - through higher sales, output and employment levels; and
- aviation industry investors* - through increased returns on, and higher valuations of, investments.

Such microeconomic benefits complement the macroeconomic gains likely to be associated with the proposed Convention/Aircraft Protocol, including increased aggregate output and income, trade and investment, employment, public sector revenues and economic growth.

In support, the study describes the relevant upstream and downstream linkage effects and multiplier effects in economies involved in the use, as well as in the manufacture, of commercial aircraft and associated equipment.

Importantly, these categories of benefits do not appear to give rise to countervailing or offsetting economic costs.

Methodology Employed

After describing the causal links between legal systems, financial markets and instruments, and economic growth, and noting the importance of these relations for the aviation sector, the study sets forth a set of "**asset-based financing principles**" against which the provisions of the proposed Convention/Aircraft Protocol must be benchmarked. These include the *transparent priority principle* (clarity on the ranking of competing property interests), the *prompt enforcement principle* (ability to promptly enforce rights against assets generating proceeds and revenues), and the *bankruptcy law enforcement principle* (ability to enforce in the context of bankruptcy). These principles provide both a framework and lexicon for subsequent analysis.

Equity Values

The study then looks at a case study of the historical gains from legal reform along the lines of the proposed Convention/Aircraft Protocol on equity values. Specifically, it examines the impact of secured transactions and leasing-related insolvency law reform in the United States on the price of airline stocks using a so-called "event study" methodology - testing the proposition that the reduced financing costs should result in a significant boost in shareholder value. Airline shareholders in the period immediately before and after the subject law reform in October 1994 enjoyed a two-week return of +9.73% compared with a gain of 1.95% for the Standard & Poor's 500 equity index. Adjusting for the comparatively high volatility of airline stocks, the "abnormal" (risk-adjusted) return on airline stocks was +4.65% during the two-week period, or about \$443 million in terms of increased market capitalization.

These increased equity values probably underestimate the analogous potential benefits to shareholders of other airlines, since the debt of most carriers tested in the study was already rated at or close to investment-grade at the time - which no doubt limited the upward movement in equity values. It therefore follows that worldwide equity values would likely increase through the proposed Convention/Aircraft Protocol by relatively larger percentages.

Financing Cost Savings

Next, the study provides a set of estimates of financing cost savings based on, among other things, ranges of pricing differentials. Such differentials reflect the greater security and, in certain cases, enhanced access to capital markets resulting from effective implementation of the proposed Convention/Aircraft Protocol.

These sets of estimates are impressive. They are on the order of \$5.0 billion annually based on 20 year projected aircraft deliveries. They assume a 100-basis-point reduction in the overall cost per annum of 12-year fixed-rate aircraft loans, and comparable savings in the case of asset-backed bond rating upgrades.

The 100-basis-point figure is hypothetical in the sense that actual annual cost reductions may vary widely. **That figure is likely to be on the higher end of the spectrum.** In a particular transaction, factors will include the comparative improvement embodied in the proposed Convention/Aircraft Protocol judged against otherwise applicable national legal rules, the relationship between legal and other perceived risks in that transaction, and the applicable financial instrument. *See also* "Select Notes and Qualifications" below.

The study also concludes that, in select cases, the cost saving provided by the proposed Convention/Aircraft Protocol will be infinite: credit will be extended in certain circumstances where before it was simply unavailable.

Other Specific Benefits

The study considers other benefits associated with the proposed Convention/Aircraft Protocol, including (i) enhanced fleet planning, operational flexibility and the resulting ability to maximize profits - major benefits for commercial air carriers, (ii) reductions in transaction

costs through standardization and simplification, (iii) assumed pass-through of interest cost savings to reduce fares (potentially resulting in a long-term increase in passenger kilometers - depending on the elasticity of demand - of up to 48 million passenger kilometers per annum worldwide), (iv) reductions in litigation costs and delays (the present value of a 30-month delay in recovery on a 10-year asset-backed bond at the end of the 30th month is + 1.23% as compared to + 8.98% under immediate recovery and sale of the asset), and (v) reduced pressure for sale of used aircraft under conditions of financial distress ("fire-sale" aircraft values have been estimated to involve discounts up to 13%).

Finally, the study considers a number of macro-economic benefits associated with the proposed Convention/Aircraft Protocol, including increased aggregate output and income, trade and investment, employment, public-sector revenues, and growth effects. In this context it analyzes the potential reductions in external country debt as a result of the proposed Convention/Aircraft Protocol and concludes that a 2-3% level for certain emerging market countries is plausible. It also notes the relationship between the availability of external finance through the proposed Convention/Aircraft Protocol and the objective of a growing number of governments to privatize all or part of their national airlines.

Select Notes and Qualifications

The proposed Convention/Aircraft Protocol contains a number of "optional" provisions. The adoption of these provisions would significantly enhance the economic value of the law reform in a particular country. ***Countries that opt-in to these provisions can expect materially greater financing-related benefits than those that do not.*** Moreover, the optional provisions contain certain features that are necessary, if not by themselves sufficient, conditions to accessing capital markets in transactions secured by aviation equipment.

The cost-savings benefits, and external debt-level-reduction benefits, are slanted in favor of developing economies whose systems do not currently reflect the asset-based financing principles. In these countries, the proposed Convention/Aircraft Protocol would generate the greatest relative improvement. Conversely, the fleet-planning benefits, and export- and employment-related benefits, are as a general proposition slanted in favor of developed economies.

To produce maximum benefit, the proposed Convention/Aircraft Protocol must be effectively implemented, including all actions necessary to ensure that their provisions will be strictly and reliably enforced by national courts. A corollary to this is that the final text of the proposed Convention/Aircraft Protocol must provide sufficient clarity and detail to enable those courts to promptly resolve disputes in accordance with its terms. Effective implementation also includes the establishment, efficient operation, and appropriate regulation of a 24-hours-a-day, seven-days-a-week international registry system in which property interests in aircraft and aircraft engines will be recorded, thus determining their priority, as contemplated by the proposed Convention/Aircraft Protocol (and the transparent priority principle referred to above).

In this study, the estimate of cost savings do not explicitly take account or otherwise reflect the role or impact of export credit financing. This is because the framework within which export credit financing is provided is established by international legal agreements rather than market conditions in the strict sense. The terms of the proposed Convention/Aircraft Protocol, however, may well be a relevant factor in the classification of risk in a particular transaction. This may have potential pricing implications in due course.

Final Comment

While a number of leading institutions in the air transport industry provided information and views which were taken into account in the preparation of this study, ultimate responsibility for the study remains with its authors.

Introduction to the Study

The objective of this study is to document, conceptually and empirically, the nature and probable magnitude of the economic gains associated with the impact of legal reforms covering the financing of commercial aircraft and aircraft engines as contemplated by the proposed Unidroit Convention on International Interests in Mobile Equipment and the Aircraft Equipment Protocol thereto (proposed "**Convention/Aircraft Protocol**").¹ Economic and financial concepts, information economics and transactions-cost economics are applied in a defensible framework for analyzing the gains and benefits associated with the law reform initiative.

The study concludes that the potential gains are both substantial and complementary, and accrue specifically to (1) end-users of the affected aircraft equipment, notably airlines and their employees, shareholders and customers, (2) governments and their national economies, through improved transportation infrastructures, the size and structure of external debt and increased commercial activity, and (3) manufacturers and their shareholders, employees and suppliers.² The study demonstrates the mutuality and economic significance of the gains with reference to the commercial aircraft sector which, in turn, may be seen to clearly justify the effort involved in designing and implementing the appropriate legal reforms.

1. **The Modalities and Implications of the Law and Finance Relationship: General Principles**

1.1 **The Causal Link Between Legal Systems, Finance and Economic Growth**

In recent years, there has been increased interest in the causalities running from legal system reform to financial market development, on the one hand, and from financial market development to economic growth, on the other. That is, it has been increasingly recognized that appropriate legal reforms can enhance the development and growth of financial markets, which, in turn, have a positive effect on economic growth by lowering the cost and increasing the availability of finance as well as promoting economic restructuring.

For example, a recent study of the legal systems adopted by 49 different countries found strong, direct links between the type of legal protection and predictability afforded and the scale and scope of financial systems that developed in each national environment.³ In turn, empirical

¹ For a précis of the proposed Convention/Aircraft Protocol, see Appendix 1. That précis has been prepared by Jeffrey Wool in his capacity as Chairman of the Aircraft Protocol Group, the group charged by the Institute for the Unification of Private Law (Unidroit) with responsibility for preparing the preliminary draft Aircraft Protocol. We would also like to thank Mr. Wool for his assistance in articulating the "asset-based financing principles" described in part 3 below.

² In many cases, such gains will be proportionally related to the applicability of the so-called optional provisions. See part 4 below. These provisions, which are summarized in point 3 of the précis contained in Appendix 1, have been specifically designed to promote asset-based financing and leasing, and may be agreed to by countries when ratifying the Convention/Aircraft Protocol.

³ R. LaPorta *et al.* "Law and Finance," National Bureau of Economic Research Working Paper 5661, 1996.

studies by the World Bank and others have documented a strong causal relationship between the scale and scope of financial development of a country and its level of income and rate of economic growth. While financial development can be defined in many ways, such as the ratio of the amount of credit outstanding to GDP, the size of a country's stock market relative to GDP and the array or menu of financial contracts available to investors and users of capital that can be used to reallocate risk, the general findings have been that a strong causal link runs from financial development to the development and growth of national economies.⁴

Such findings viewed together suggest that, by increasing domestic and international capital flows, appropriate legal reforms can play a substantially more central role in the economic development process than previously thought. International capital flows can, in turn, contribute disproportionately to market liquidity, and tend to force the pricing of financial instruments into line with those prevailing on global markets. They can encourage upgrading of trading systems, clearance and settlement utilities, information disclosure, accounting standards and custody services. They can improve the process of corporate governance, and they can serve as a bellwether for local and global portfolio investors.

In a further recent study⁵ it has also been shown that improved performance of the financial system aids most those industries that for technology-related reasons (e.g., project size, cyclicity, engineering complexity, infrastructure characteristics) rely more than other industries on *external finance* (i.e., financing other than through retained earnings). The commercial air transport sector is an excellent example of an industry that, for technology-related reasons, is highly dependent on the availability and cost of external finance for its development and growth. The implication is that (a) industries more in need of, and with access to, external finance develop disproportionately faster than in countries with more developed financial markets and (b) an important factor governing the availability of such external finance is the relative development of the underlying legal system. For example, the output of airlines (air transport services) in developed capital market countries will tend to grow more rapidly than the output of airlines in countries with less developed capital markets, with the difference in growth rates likely to be much larger than those between industries that are less technically complex (e.g., food, tobacco and beverages).

⁴ Specifically, the evidence suggests the following. First, countries that had more-liquid financial markets in a base period tended to grow much faster over the next several decades than those which did not. Second, capital market development seems to complement—rather than substitute for—bank finance, both of which seem to promote growth independent of each other. Higher levels of development of the banking system are associated with faster growth no matter what the state of development of the capital market, and vice-versa (see, for example, R. Levine "Financial Development and Economic Growth: View and Agenda," *World Bank Policy Research Paper*, 1678, 1996).

⁵ R.G. Rajan & L. Zingales, "Financial Dependence and Growth" University of Chicago, American Economic Review (forthcoming 1998).

1.2 External Finance vs. Internal Finance

There are two broad ways in which any company (*e.g.*, an airline) can finance its investments. The first is internal finance, such as net cash flows or net profits from operations. The second is external finance, such as raising funds in the debt, leasing and (where they exist) equity markets or government funding. For example, the average contribution of external finance to airline capital expenditures over the 1990-1994 period alone was 76.7%.⁶ Specifically, because of its technology and capital-intensive nature, cyclical nature and competitive structure, the commercial airline industry is heavily dependent on external finance. This suggests that constraints on the availability of external finance and/or the high cost of external finance will have a *greater adverse impact* on this industry than most other sectors of the economy. They will therefore adversely impact the macroeconomic performance and growth rates of all countries in which airlines form a significant sector of the economy, particularly since air transportation is part of the economic infrastructure and there are important linkages to most other industries as well as to economic performance in general.⁷

1.3 The Causal Link Between Legal Systems and the Menu and Availability of External Finance Instruments

The array, or menu, of external financial markets and instruments available to an airline to raise funds is closely linked to the financial development of the country in which it is located. A country's financial development is, in turn, causally determined by its legal, regulatory and accounting systems.

In a well-developed modern financial system, borrowers face a range of alternatives for obtaining financing depicted in Exhibit 1.⁸ Obviously, not all borrowers have access to all of the alternatives depicted here, as suggested in Exhibit 2. But even small or medium-size companies that are basically limited to bank borrowing can - under appropriate legal and financial conditions - subsequently have their loans securitized and benefit from access to a much broader pool of funding sources such as institutional investors. That is, where appropriate legal structures are in place, it is possible to convert illiquid bank loans into liquid securities. Liquidity adds value. Some of the gains from such activities will tend to be partially passed backward to the borrower.

⁶ Source, *Jet Finance*, "Analysis of the Comparative Ability of the European Airline Industry to Finance Investments," Draft Report, May 1995 [hereinafter, "**Jet Finance Draft Report**"].

⁷ See part 6 below describing the macroeconomic gains associated with the proposed Convention/Aircraft Protocol.

⁸ Similarly, today's modern financial system provides a wide range of opportunities for investors allowing them to optimize their asset portfolios by taking advantage of the domestic and international portfolio diversification inherent across the range of financial instruments being offered. Investor behavior, notably performance-oriented asset-selection on the part of fund managers in their fiduciary roles, drives much of global finance and the alternatives facing borrowers worldwide.

The innovation process giving rise to financial alternatives can be summed-up in terms of Exhibit 3, which considers the basic motivations of the end-users of the financial system - those who have financial resources and those who need them - and the kinds of services that represent value-added to these end users. This value-added can be provided by all kinds of financial services firms ranging from global banking institutions to financial boutiques, with the competitive dynamics of the industry determining the kinds of distribution gateways that will be used. This Exhibit shows the context in which asset-based bank financing and asset-backed securities can play a major role in optimizing the performance of both the ultimate borrowers and ultimate investors. In particular, legal reforms that encourage asset-based bank or securities financings will allow borrowers to move along the continuum from unsecured loans to secured loans and from secured loans to secured bonds (asset-backed bonds). The benefits of moving along this continuum (as well as the barriers) are discussed in part 2 below.

To apply these general principles to our subject matter, airlines around the world have the potential to draw on a wide range of financing alternatives—or the financing continuum—as depicted in Exhibit 2. Major airlines in countries with well-developed legal and financial systems would be positioned toward the right side of the chart, and airlines from developing countries mainly to the left. What the proposed Convention/Aircraft Protocol potentially would do particularly to the extent the optional provisions are applicable—is increase the availability of asset-based financing, as well the possible addition of asset-backed securities, to the selection of alternatives available in Exhibit 1. With respect to the latter, it would enhance the prospects of securitized financing to the wider spectrum of airlines depicted in Exhibit 2.⁹

2. The Benefits of Moving Along the Asset-Based Financing Continuum

2.1 Unsecured Loans to Secured Loans: Barriers and Benefits

In providing or supplying external finance, a key concern of a lender/investor/lessor is risk-adjusted return. For example, the return on debt contracts such as loans and bonds is constrained to a maximum upside of an interest payment plus return of principal.¹⁰ However, on the

⁹ This assertion and similar assertions in this study assume in varying degrees that investors are prepared to make their investment decisions without reference to so-called sovereign or political risk. For purposes of this study, political risks can be divided into two general categories. First, countries may increase investor risk or reduce investor return by manipulating legal rights and protections. This category will be addressed by the proposed Convention/Aircraft Protocol. See, in particular, point 4 in the précis and explanatory note 24 thereto. Second, countries may increase investor risk or reduce investor return by taking action in violation of applicable law. It follows that no law reform can eliminate this category of risk, although making the relevant law an international treaty obligation provides countries with strong compliance incentives. Any residual political risk would thus need to be priced in the cost of credit or insured against (although the current market for political risk is driven more by capacity than by pricing). In that the first category of risk will be substantially eliminated, the cost associated with such residual political risk should be lower than those contained in current political risk calculations.

¹⁰ Financial lease or conditional sale transactions have similar pay-off structures to loans and bonds with fixed or floating rental or installment payments over the contract's life. On maturity of a financial lease transaction (or, at times, of a non-financial lease transaction) there may or may not be a final "balloon" payment depending on who has claims to the salvage value of the leased asset.

downside, the lender or investor can lose all promised interest plus a large part (if not all) of the principal if a borrower becomes insolvent. Unlike an equity investor, who may gain or lose depending on how the company performs, a debt-investor or a lender or a lessor will never receive more than the contractual amount, and may well receive less. Because of this downside risk and the general limitations on extending unsecured credit, many lenders require some form of security backing to a loan or debt contract—a so-called asset-backed (or asset-based) financing.

Virtually all aviation industry lenders require such security. The prevalence of secured financing in the aviation industry is attributable to a number of factors including, most notably, (i) the strong projected residual values and lengthy useful lives of aircraft equipment, (ii) the cyclical nature of the aviation industry combined with the requirements for long-term financing of aircraft equipment, and (iii) the magnitudes of the financings and thus the risks involved. Tenor as well as leverage are critical. This requires the posting of collateral such that, should a borrower default, the lender/investor/lessor can claim the assets serving as backing for the financing. In a simple example of asset-based financing, a bank making a loan to an airline for the purchase of an aircraft can take possession and sell the underlying collateral (the aircraft) should the airline default on its interest or principal repayment or lease obligations. The proceeds of such sale would be applied against the amount of the loan then outstanding.

Due to inherent characteristics related to legal enforcement, national bankruptcy legislation, and asset mobility and depreciability, some assets make better collateral than others. Similarly, the underlying commercial and bankruptcy law and judicial system may render otherwise good collateral less valuable. The essential question that a lender must ask in assessing the extent to which its loan is truly asset-based—and thus worthy of risk analysis which takes account of the anticipated value of the collateral¹¹—is this: on default, can it quickly enforce its claim against the assets posted by the debtor as collateral and convert such collateral into proceeds? From this basic question we may derive the key principles underlying asset-based financing. These principles, in turn, may be used as criteria against which to assess whether the proposed Convention/Aircraft Protocol embodies asset-based financing concepts and thus the extent to which their enactment in a particular country will result in the benefits discussed in this study.

The key principles underlying the ability to extend asset-based financing are that a financier or lessor (a) should be able to determine and assure itself that its proprietary interest in a financed or leased asset is *superior* to all potential competing claims against that asset, (b) upon default, will be able to *promptly realize the value* of the asset and/or redeploy that asset for purposes of generating proceeds/revenues to be applied against amounts owed, and (c) will not have their

¹¹ A basic premise underlying the analysis in this study is that the trade-off between risks and returns are efficient. The implications of this proposition are that, for a given borrower, (i) the risks and returns in an asset-based financing are lower than in an unsecured financing, and (ii) the magnitude of such risk/return differential will relate (in addition to the perceived value of the collateral) to the ability of a lender to realize such value-added in the case of default. It follows that a principal benefit of the proposed Convention/Aircraft Protocol lies not merely in its encouragement of asset-based financing (where it would otherwise be unavailable), but also in its potential for the rationalization of pricing, that is, *clearer risk/return differentiations* along the continuum of an unsecured financing (more risky and thus more costly), on the one hand, and a fully secured financing based on the asset-based financing principles (less risky and thus less costly), on the other.

rights described in (a) and (b) above qualified or modified in the *context of bankruptcy or insolvency*. In this study, such principles shall be referred to as the "**asset-based financing principles**."

Whether a legal system or law reform initiative embodies asset-based financing principles, and is correspondingly economically valuable,¹² depends crucially on three key factors: (i) the quality and transparency of the registry of property interests, (ii) the speed with which legal enforcement is available, and (iii) the ability to enforce contractual rights when a borrower or lessee is bankrupt or insolvent.

As has been noted in previous studies,¹³ many legal systems do not embody asset-based financing principles. In particular, the ability of creditors to establish and enforce claims against debtors in many developing countries have been notably weak. Often, the priority of claims in national registries of security interests are nontransparent, and legal enforcement can take years. As a result, only a small subset of assets - most notably immobile and "non-depreciating" real estate - is viewed as providing adequate collateral protection to creditors, i.e., represent good forms of collateral. By contrast, mobile property (such as commercial aircraft) is often viewed as bad collateral. In particular, for a mobile and technologically depreciating asset such as a commercial aircraft, its value as collateral will depend in large part on the speed and legal certainty with which a creditor can repossess the equipment and sell or lease it on debtor default. The longer the time between default or bankruptcy and repossession, and between repossession and sale or redeployment—as well as the greater the associated legal and transaction costs—the lower the expected recapture-value of the asset, the greater the opportunity cost and the greater the risk exposure of the creditor.

To the extent that true or pure asset-based financing is essentially confined to immobile assets such as real estate, the cost of funding rises and its availability shrinks to external finance-dependent firms whose assets are heavily concentrated in technologically depreciating mobile property such as commercial aircraft. One way in which creditors can compensate for the absence of true asset-based financing is to raise interest rates or leasing costs. However, there is a limit to which such rates can be raised, since excessive rates can induce progressively higher risk-taking incentives by the borrower¹⁴ such that higher interest rates or leasing costs may

¹² Such value lies in the economic benefits discussed in parts 4, 5 and 6 of this study. Countries may, of course, have *non-economic policy reasons* for having a non-transparent registry system, slow enforcement procedures, and/or bankruptcy laws which qualify contractual and security rights. In addition, the non-economic policy values embedded in these legal institutions may or may not reflect contemporary thinking or such thinking as applied to the financing of commercial aircraft equipment. Such non-economic policy assessment, and the weighing of non-economic value against economic value, are outside the scope of this study.

¹³ See, e.g., H. Fleisig, "The Power of Collateral," Private Sector Development Department, The World Bank, Note No. 43, April 1995.

¹⁴ Technically, these reasons are related to *adverse selection* and *moral hazard*. For example, to pay very high interest rates a borrower may be induced to take increased risk so as to repay the loan. (See, e.g., J.E. Stiglitz & A. Weiss, "Credit Rationing in Markets with Imperfect Information," *American Economic Review*, 1981).

actually *lower* the expected returns to the lender. As a result, when price can no longer be used to ration credit, the lender has no choice but to restrict its availability. As a result, in countries where the perfection, enforcement, priority and/or bankruptcy rearrangements of creditor claims over collateralized assets is problematic, the cost of external loan finance tends to be higher and its availability lower than in countries whose judicial system embody the asset-based financing principles.¹⁵ In the latter countries, the establishment and enforcement of property rights is much easier, and mobile property may be used as collateral backing for loans and leases, as well as asset-backed securities.

2.2 Secured Loans to Secured Bonds: Barriers and Benefits

While mobile property is often used in developed countries to secure bank loans, bank debt is not necessarily the lowest-cost external financing vehicle for a firm (see Exhibit 2). That is, while the posting of collateral can lower external financing costs—and an assured prompt legal claim on collateral can lower them still further—the replacement of asset-backed loans by asset-backed bonds can potentially lower the costs of external finance even more. The ability of asset-backed bonds to reduce financing costs requires well-developed legal and financial systems, or access to such a system through cross-border finance. Asset-backed bonds are often relatively complex instruments. They require not only sophisticated investors, but also a sophisticated legal, accounting and informational infrastructure, including capable debt-rating agencies. Nevertheless, by further reallocating risks between originators and investors and accessing a deeper source of funds, asset-backed bonds have enormous potential for reducing the cost and increasing the availability of external finance to those firms (such as commercial air carriers) heavily dependent on external finance.

Specifically, bank loans by themselves are rather illiquid for the originator (the bank). In the absence of a well-developed secondary market for loans, an originator such as a bank has to hold the loan on its books until maturity.¹⁶ One way to introduce some degree of liquidity, especially if the loan is large in size, is to syndicate the loan by selling participations or shares on origination to other banks. Currently, a growing portion of major-airline finance is in the form of such syndicated loans. However, even in the case of syndications, the buyers of loan participations are largely limited to other banks and a limited number of non-bank financial institutions, and very little secondary market trading/selling takes place in these loans after origination and prior to maturity.¹⁷ In particular, a significant group of investors prominent in the capital markets such as insurance companies, mutual funds and pension funds are largely precluded from participation. As a result, an *illiquidity premium* may be impounded in the required interest rate charged by bank lenders to borrowers such as commercial airlines.

¹⁵ Fleisig (1995), "The Power of Collateral" shows that significant external finance cost and availability differences exist between Argentina and Bolivia on the one hand and the U.S. on the other because of the greater degree to which asset-based financing principles are satisfied in the U.S.

¹⁶ In fact, a significant proportion of aircraft loans are currently held by European and Japanese universal banks. *See Jet Finance Draft Report*.

¹⁷ For example, loan sales peaked in 1987-89, but have since declined. One reason for this decline is because the volatility of credit risk is now lower than it was at the end of the 1980s. (*See The Loan Pricing Corporation, Gold-Sheets*, various issues). The lower the volatility of credit risk, the lower the attraction of loan trading.

One way in which asset liquidity can potentially be enhanced and the cost of funds reduced is through an asset-backed bond financing. Suppose a pool of assets are “ring-fenced” and sold by a bank or corporation to a subsidiary especially established for this purpose, a so-called or special-purpose vehicle “SPV”. In turn the SPV sells bonds backed by these assets (and their cash-flows) to an array of institutional investors in the capital market. The proceeds of the bonds pay for the SPV’s purchase of assets from the originating bank or corporation. These bonds can pay either a fixed interest rate and be secured by the underlying assets held by the SPV or can “pass-through” cash flows received on the assets in the pool to the bondholders—such as lease payments on underlying aircraft assets. Moreover, different classes of bondholders can be created with different claims (in terms of priority in default, coupon rates and expected maturity) to the underlying cash flows and asset collateral. By issuing several classes (or tranches) of bonds, different investors’ preferences regarding maturity, interest rate risk and credit risk exposure can be better satisfied and the overall cost of funds lowered for the originating bank or corporation compared to a single-class bond issue. Moreover, the collateralized bonds can be traded more easily in secondary markets than loans, and thus represent more liquid instruments.¹⁸

Traditionally, the term “securitization” has referred to the process of packaging illiquid financial assets held on the books of banks, savings associations, mortgage lenders, insurance companies and corporations in such a way as to be able to sell participations in the package to capital market investors. A number of residential mortgages, for example, can be sold to a single-purpose trust, and the trust pays for these mortgages out of the proceeds from the sale of trust certificates representing proportionate ownership of the trust assets. In a broader context, securitization has come to represent a general trend of moving relatively non-marketable assets off of the balance sheets of financial institutions and corporations and into the vast pool of liquid assets in the national and global securities markets.

Securitization occurs when an asset holder finds it desirable to liquidate or restructure its balance-sheet-for reasons of profitability, because of interest rate and liquidity mis-matches of its assets and liabilities, or because of the need to adjust the overall size and debt capacity of its balance sheet. Securitization also occurs when the traditional customers of financial institutions discover alternate ways to finance at lower costs from other sources. The process of securitization of loans has been greatly accelerated by the considerable structural changes that have occurred in capital markets over the past two decades.

Since the use of the first pass-through bonds involving government agencies as quasi-guarantors to securitize fixed rate mortgage loans in the early 1970s, the securitization technique has been successfully extended to a variety of other assets as well. As the transaction costs of using available securitization technology have declined and the advantages to financial institutions have become more apparent -e.g., increased asset liquidity and a superior ability to manage

¹⁸ Karl P. Essig, “Pass-Through Certificates Backed by Lease Payments for Commercial Aircraft,” Chapter 23 in Jess Lederman (ed). *The Handbook of Asset-Backed Securities*, pp. 453-460, Richard Jory, “Leading by Example,” *International Securitization Report*, p. 20, *IFR Transport Finance*, October 1996, and Richard Jory, “Leased But Not Last,” *International Securitization Report*, p.18, *IFR Transport Finance*, June 1996

interest-rate risk exposures—potentially all bank loans have become securitizable.¹⁹ (Exhibits 4 and 5 show the chronological progression of asset securitization in the U.S. market.)

The easiest way to appreciate the potential for asset securitization is to look at the far greater trading volume of emerging-market Brady bonds compared to the trading volume of emerging-market bank loans. That is, the trading liquidity of bonded debt is generally much higher than tradeable bank debt. All of the outstanding Brady bonds represent non-U.S. emerging-market issuers and are found in institutional and individual investor portfolios around the world.

The foregoing suggests a large potential investor appetite for asset-backed securities related to aircraft financings and large potential benefits in terms of the cost and availability of credit in this highly capital-intensive sector of the global economy. International aircraft-backed securitization, however, is only likely to grow if governments in general change legal structures to embody the asset-based financing principles. The reason for this is simple: that form of financing—to the extent viewed and priced by institutional investors as presenting lower risks (on account of assured and timely recourse to highly valued aircraft equipment) than other forms of credit extension—by necessity presupposes the legal means to achieve that risk reduction.

2.3 Commercial Aircraft Securitizations

The scale of securitization of commercial aircraft-related assets has so far been small.²⁰ In most cases, the underlying assets have been commercial aircraft leases (and the lease payments thereon) backed by the physical aircraft as security. In the majority of deals only one aircraft is securitized and one class of bonds issued (this is usually called an **"Equipment Trust Certificate"**). However, some asset pools contain multiple aircraft leased to foreign and domestic airlines with multiple classes (tranches) of bonds carrying different maturities and credit-risk protections, with both lease payments and the proceeds from aircraft sales being "passed-through" to investors to cover interest and principal due on the bonds.²¹

These securitization packages are invariably complex, requiring various credit-risk guarantees and liquidity guarantees to investors should airlines default on their leases and the associated payments. Importantly, many U.S.-originated airline securitization packages are rated, and become marketable, by virtue of the fact that investors are protected by Section 1110 of the U.S.

¹⁹ In 1997, for example, Swiss Bank Corporation Warburg and Lehman Brothers introduced Clives, or Credit-Linked Vehicles Loan Securitization Program, which give investors an interest in special-purpose entity whose assets consist of a blended portfolio of loans originated by SBC.

²⁰ It has been mainly limited to the United States, although there have been three major securitizations of aircraft leases by GPA, the Irish aircraft lessor, and one large scale securitization of secured debt and lease financings for various airlines operating regional aircraft manufactured by Bombardier Inc.

²¹ The pass-through of asset proceeds creates a potential early-call risk feature labeled *prepayment risk*. That is, bonds may be retired earlier than expected if cash flows are larger than projected.

Bankruptcy Code ("**Section 1110**").²² Specifically, should an airline enter into Chapter 11 bankruptcy, the bondholders (creditors) may repossess the collateral (the commercial aircraft and associated equipment) within 60 days of the debtor's filing for bankruptcy in the event the debtor does not resume payments.²³

2.4 Section 1110 and Rating Enhancement: The Paradigm

The importance of Section 1110 protection with respect to the cost of external asset-backed finance available to the airline industry is significant in that the major international credit rating agencies will give a rating enhancement of up to two notches (e.g., Standard & Poor's rating raised from B to BB-) to debt issues so protected. Such rating enhancements can have a material effect on the cost of funds facing the issuer. In addition, provided that additional assets protected under Section 1110 are posted as collateral relative to the size of the debt outstanding (i.e., the collateral-to-debt ratio is greater than 100%) and a dedicated source of credit support is available to cover the grace and sale periods, even further rating upgrades are possible (such enhanced issues will be referred to as "**Enhanced Equipment Trust Certificates**"). For example, over-collateralization by a specific factor or more can result in three full-category rating upgrades under Standard & Poor's rating standards.²⁴

3. Characteristics of the Proposed Convention/Aircraft Protocol Promoting Asset-Based Financing and Securitization

In this section we will provide background to the assessment of gains and benefits from adoption of the proposed Convention/Aircraft Protocol contained in parts 4 through 6 below. This will be done by considering the extent to which these legal instruments contain asset-based financing and securitization-promoting characteristics, as discussed above. For reasons of simplicity, we will assume the terms of these legal instruments as summarized in the précis to be found in Appendix 1 of this study. Undefined capitalized phrases used in this part 3 and parts 4 through 6 will take their meanings from that in the précis. In particular, mandatory provisions (i.e., those that apply to all ratifying countries that ratify) under the legal instruments will be denoted "**basic convention rules**," and the so-called optional provisions (i.e., those which countries may opt into or opt out of) will be denoted "**optional convention rules**."

²² See P. Baggaley "Criteria for Enhanced Equipment Trust Certificates," Standard & Poor's Global Sector Review p. 18, August 1995.

²³ Because of legal uncertainties surrounding the applicability of Section 1110 to certain non-"purchase money" aircraft financings, the Bankruptcy Reform Act, passed on October 22, 1994, provided that Section 1110 covered all qualifying aircraft financings secured by aircraft or parts and/or any aircraft leases entered into after the date of the legislation's enactment.

²⁴ See P. Baggaley, "Criteria for Enhanced Equipment Trust Certificates," Standard & Poor's Global Sector Review, August 1995, p. 18.

3.1 Asset-Based Financing Characteristics

As mentioned above, the asset-based financing principles permitting central consideration of asset values in any rational risk/return financing assessment are as follows: First, a financier or lessor must be able to determine whether, and ensure that, its proprietary interest in a financed or leased asset is superior to all potential competing claims against the asset. This first principle will be referred to as the "**transparent priority principle**." Second, a financier or lessor must have the ability upon default to promptly realize the value of the asset and/or redeploy the asset for purposes of generating proceeds/revenues to be applied against amounts owed. This principle will be referred to as the "**prompt enforcement principle**." Third, the rights of a financier or a lessor relating to the transparent priority principle and the prompt enforcement principle must not be qualified or modified in the context of bankruptcy or insolvency. This principle will be referred to as the "**bankruptcy law enforcement principle**."

3.1.1 Treatment of the Transparent Priority Principle Under the Proposed Convention/Aircraft Protocol

An essential feature of the proposed Convention/Aircraft Protocol is the establishment of an international registry system in which all security-type and leasing interests in and transfers of aircraft equipment must be registered in order to ensure their priority against third parties. With one exception, such priority will be determined on a first-in-time basis. The exception runs in favor of so-called "**preferred nonconsensual creditors**," that is, categories of nonconsensual creditors (such as tax creditors and repairers) designated as such by countries during their ratification of the proposed Convention /Aircraft Protocol.

The basic convention rules create an international registration system and concomitant priority framework that are consistent with the transparent priority principle. They will eliminate the risk of secret or hidden (consensual) interests in aircraft. They will thus facilitate asset-based finance, to a degree, in all countries without such a registration system and priority framework, and will encourage cross-border financing transactions by establishing this system and framework on an international basis.²⁵

In contrast, preferred nonconsensual creditors are, in effect, hidden lien-holders. While there are undoubtedly strong reasons for countries to designate certain creditors as preferred nonconsensual creditors (such as encouraging prompt repair of damaged equipment), such designations should be limited to ensure the maximum economic benefit of the proposed

²⁵ This international registry system is analogous - in economic terms - to an international clearinghouse of ownership and other proprietary claims. Seen in these terms it has the potential to enhance the liquidity of the debt claims backed by these assets as well as by the assets themselves. A good analogy is the Eurobond market. Prior to the establishment of centralized clearing houses in the 1960s, Eurobonds were highly illiquid instruments and therefore very difficult to trade. The establishment of Euroclear and Cedel as credible international centralized clearing houses, depositories and registries for Eurobonds allowed cross-border trading in these instrument to develop rapidly. See I. Giddy, A. Saunders & I. Walter "Securities Clearance and Settlement Prospects for Convergent Markets," J.P. Morgan, 1992. The resulting efficiency gains to issuers and investors in the Eurobond market were spectacular.

Convention/Aircraft Protocol. The more limited this category, the more asset-based financing principles will be respected and thus risk/return assessments will reflect such principles.

3.1.2 Treatment of the Prompt Enforcement Principle Under the Proposed Convention/Aircraft Protocol

The proposed Convention/Aircraft Protocol provides financiers and lessors with the ability to take possession and sell or redeploy aircraft equipment in the case of default under the basic convention rules. Their ability to do so (and to take other actions necessary for the practical realization of these intended remedies, such as the ability to deregister and export the aircraft) *promptly*, however, are contained in optional convention rules of two kinds. First, countries may agree that these remedies will be available without judicial assistance or intervention, i.e., a country may permit (or prohibit) nonjudicial remedies (so-called "self-help"). Even if such unilateral creditor action is permitted by a particular country, it may be restricted to the extent such action violates public order or breaches the peace. A second and potentially effective optional convention rule requires countries to prosecute judicial proceedings relating to the asset (although not to ultimate liability) on a "speedy" basis or, alternatively, within a maximum timetable (the "**specific expedited relief rule**").

The applicability of one or both of these sets of optional convention rules are *essential to maximizing the potential financing-related benefits of the legal instruments* in a given country, particularly, but not exclusively, to countries in which the risk of material enforcement delays is currently a key factor in risk/return lending assessments.²⁶

It is therefore necessary to point out a problematic ambiguity in the formulation of the specific expedited relief rule in the draft text. ***If not clarified in a manner consistent with the prompt enforcement principle, it would reduce such financing-related benefits.*** That ambiguity is contained in Article 15 of the proposed Convention and relates to the bracketed wording that suggests that the listed default remedies need not be cumulative. It is integral to our analysis that the full set remedies, including the ability to sell or redeploy aircraft equipment and realize and apply the resulting proceeds, are promptly available to financiers and lessors in countries that accept the optional expedited relief rule. To the extent economic considerations are a primary consideration, that Article should be reformulated to ensure that **any and all** specified default remedies are promptly available.

3.1.3 Treatment of the Bankruptcy Law Enforcement Principle Under the Proposed Convention/Aircraft Protocol

The treatment of a financier or lessor in the context of bankruptcy or insolvency proceedings (or their functional equivalent) is the *litmus test of an asset-based financing*. Based on such treatment, we might usefully differentiate between a true or pure asset-based financing, on the one hand, and a quasi-asset-based financing, on the other. In a quasi-asset-financing, important contractual, proprietary or priority rights of a creditor are invalidated or materially qualified or

²⁶ See part 5.2 below.

modified when they are needed the most, that is, when a debtor's assets are being liquidated or reorganized

The optional convention rule denoted the "*international insolvency rule*" will, together with the rules described above, permit countries to put in place a system consistent with true asset-based financing principles. In particular, the international insolvency rule will assist in internationalizing the types of financing benefits and alternatives available to U.S. airlines under Section 1110.

As with the other optional convention rules, countries will be asked to weigh the very clear economic benefits of this provision with the competing economic and noneconomic values underlying their existing rules.

3.2 Characteristics Promoting Asset-Backed Lending and Securitization

Asset-backed lending and securitization of commercial aircraft-related assets holds out the potential to both reduce the cost of aircraft-backed credit, as well as to increase its availability and investor base.

Following the methodologies of the leading credit agencies, but making appropriate discounts based on the initial novelty of this international system (and thus initial lack of precedent and experience) and for varying levels of political risk,²⁷ the proposed Convention/Aircraft Protocol has the potential to promote both lower-cost asset-backed bank lending and securitized financing.

Its ability to do so, however, is directly linked to the applicability²⁸ of the optional provisions, particularly the *timetable elements* of both the specific expedited relief rule²⁹ (applicable to non-bankruptcy enforcement) and the international insolvency rule³⁰ (applicable to bankruptcy enforcement) where and to the extent that the rules of particular legal systems are unclear or open-ended on these issues.

²⁷ See footnote 8 above. An annotation to the proposed Convention/Aircraft Protocol notes that governments should consider the desirability of adding an optional provision requiring fair compensation - objectively determined - prior to any government confiscation, condemnation or requisition of aircraft equipment. (There would be an exception to the requirement for *prior* compensation in the case of a declared national emergency.) That provision, if included in the Aircraft Protocol, would further reduce (although not eliminate) political risks in countries which do not "opt out," thereby increasing the economic value of the proposed instruments.

²⁸ It is imperative that the wording of these provisions be objective and clear so that national courts will be unable to apply their own standards thereby diluting the required predictability that is essential to secured or securitized transactions.

²⁹ See part 3.1.2 above noting the need to reformulate Article 15 of the proposed Convention. See also point 3(b) of the précis attached as Appendix 1.

³⁰ See point 3(c) of the précis attached as Appendix 1.

Finally, in order to maximize the investor base in such securitized transactions, continued capital market reform remains desirable.

4. Estimates of Funds Availability and Cost Savings Resulting From the Adoption of the Proposed Convention/Aircraft Protocol

4.1 General Background, Methods and Assumptions

Aircraft manufacturers have projected a rapid growth in new aircraft demand and passenger miles over the next 20 years, most notably in emerging markets.³¹ Major commercial aircraft suppliers estimate total financial requirements (in 1996 dollars) of over \$1 trillion to purchase over 16,000 commercial aircraft, with an increasing share of global passenger traffic being taken up by airlines in Asia, Africa, Eastern Europe and Latin America. For example, the share of global capacity operated by North American airlines is estimated to decrease from 39% in 1996 to 28% by the year 2016.

Given this tremendous overall expected growth, plus the faster relative growth rate in purchasing needs of developing and emerging-market country airlines, the question of the availability and cost of external finance becomes crucial. It is in the context of this large projected expansion in new aircraft and related equipment purchases over the next 20 years that the benefits of the proposed Convention/Aircraft Protocol, and its potential for allowing carriers to move along the financing continuum, will be evaluated.

4.2 Increased Funds Availability and Reduced Financing Costs Under the Proposed Convention/Aircraft Protocol

As discussed in part 2 above, the proposed Convention/Aircraft Protocol, particularly where the optional convention rules are applicable, will potentially allow developing and emerging-market country airlines improved access to secured loans and leases on a commercial basis, and will enhance the prospects of their access to international capital markets.³² The associated increase in funds availability and reduction in world airlines' external interest costs - and thus overall

³¹ In that the principal research backing this study was undertaken in 1997, the 20 year worldwide and regional aircraft demand and passenger mile assumptions made herein and in the supporting material cover the period of 1997-2016, and are based on consensus forecasts issued in 1997. See Airbus Industrie, "Global Market Forecast," March 1997 and The Boeing Company, "1997 Current Market Outlook," March 1997. The updated 20 year forecast issued in 1998 indicate an even greater worldwide demand for commercial jet aircraft, notwithstanding the current economic problems affecting the Asian region. See Airbus Industrie, "Global Market Forecast," April 1998 (forecasting a US\$1.2 trillion market for the period of 1998-2017) and The Boeing Company, "1998 Current Market Outlook," June 1998 (forecasting a US\$1.25 trillion market for the same period). The aggregate benefits associated with the Convention/Aircraft Protocol described in parts 4-6 below should accordingly be adjusted upward to reflect such increased demand.

³² Implementation of the legal reforms of the type contemplated by the proposed Convention/Aircraft Protocol are necessary, but not sufficient, conditions to the accessing of international capital markets. See, for example, footnote 9 above.

financing costs - can be viewed as one indicator of the economic benefits of the proposed Convention/Aircraft Protocol.

In particular, the ability of emerging-market airlines to better tap³³ the secured loan market as they move along the financing continuum should be a major direct source of benefit from the proposed Convention/Aircraft Protocol.³⁴ A second source of benefit will be the potential³⁵ reduction in required sovereign guarantees on airline debt of emerging-market countries. This will free-up emerging-market countries' resources for use in other economic development areas, or reduce debt-service ratios.³⁶

4.3 Asset-Based Financing Cost Savings Under the Proposed Convention/Aircraft Protocol : The Methodology

The reduction of funding costs and increased availability of external finance should have direct beneficial effects on airline earnings, airline investment and thus overall airline output growth (e.g., as measured by revenue passenger kilometers). Some of these benefits are likely to be shared with customers (airline passengers) through increased airline services and/or lower fares. While very broad estimates of potential funding-cost savings can be obtained by analyses of airline, country or regional interest costs in banking and capital markets, it is also possible to compute some very narrow measures of cost savings by means of focused case studies.

We first calculate the cost savings from a narrow, focused study of the benefits to U.S. airlines from the passage of the 1994 Bankruptcy Reform Act (and Section 1110) on U.S. airline equity values and debt costs. We then make some broad estimates of possible cost savings to the global airline industry from the passage of the proposed Convention/Aircraft Protocol.

It should be noted, however, that in making these broad estimates of cost savings *we do not take account, or otherwise reflect the role or impact, of "export credit financing."* For our purposes, export credit financing may be defined as credit, guarantees or other financing support provided by governments (or governmentally owned or mandated corporations or entities) for the specific purpose of facilitating the sale and export from their countries of aircraft equipment. The reason for this exclusion is that

³³ As noted earlier, for reasons of excessive risk, certain borrowers are unable to access loans at any price.

³⁴ For example, to the extent that emerging market airlines are credit-rationed this is conceptually equivalent to their facing an "infinite" cost of funds.

³⁵ A number of considerations, including any perceived risk of noncompliance with the proposed Convention/Aircraft Protocol and broader political and credit risks, will be taken into account by financiers and other risk assessors in determinations relating to the continuing need, in appropriate cases, for sovereign guarantees. It may, however, be conservatively stated that the proposed Convention/Aircraft Protocol - by permitted greater reliance on asset values in overall assessments of risk - reduce the need, in varying degrees, for sovereign support. For further discussion, see part 6.5 below.

³⁶ This is especially relevant for IMF-type restrictions on sovereign debt.

the framework within which export credit financing is provided is established by international legal agreements under the auspices of the Organization for Economic Cooperation and Development ("OECD"), rather than by market conditions in the strict sense. Extended time forecasts involving this OECD framework, or attempts to assess the economic interplay among it, commercial financing and leasing of aircraft equipment, and the law reform contemplated by the proposed Convention/Aircraft Protocol, would be speculative and would lack empirical data.³⁷

Nonetheless, the proposed Convention/Aircraft Protocol are relevant to export credit in several ways. First, the export credit agencies are moving towards asset-based financing. These instruments will thus assist in their ability to carry out their mandates. Secondly, as primary risk-takers in transactions, the export credit agencies - and thus national treasuries and by extension their tax-paying base - directly benefit from the general risk reduction occasioned by the proposed Convention/Aircraft Protocol. While this type of benefit does not lend itself to quantification, it is significant. Thirdly, the export credit agencies charge airlines a "risk premium," that is, an amount charged to partially compensate for transaction risk. The applicability of the proposed Convention/Aircraft Protocol may well be a relevant factor in the classification of risk in a particular transaction. This may have potential pricing implications in due course. In sum, since export credit finance is likely to remain an important part of the aircraft financing landscape, legal initiatives that assist in its operations will ultimately pass through to airlines, governments, manufacturers and other involved parties as well.

4.4 Analogy to the Effect of the Passage of the U.S. Bankruptcy Reform Act of 1994 on U.S. Airlines Equity Values and Debt Costs

The passage of the U.S. Bankruptcy Reform Act of October 22, 1994 (the "**Reform Act**") resolved many uncertainties regarding the application of Section 1110 to secured creditors in U.S. airline bankruptcies.³⁸ By analyzing the market pricing and returns on U.S. airline stocks before and after the passage of the Reform Act—using a so-called "event study"—it is possible to project some measures of the potential benefits to airlines from a similar type of law reform—which, as a conceptual matter, is one way of characterizing the reform contemplated by the proposed Convention/Aircraft Protocol.

In an efficient equity market, the stock market value of each company reflects the current and expected future earnings (dividends) of that company. That is, any regulatory reform viewed as favorable for the profitability of a company should be impounded in the valuation of its tradeable equities (i.e., by an appreciation in share price). The methodology to evaluate the

³⁷ In addition, it should be noted that no current aircraft equipment transactions are wholly supported by export credit financing, and most - outside of transactions to developing markets - are not supported by export credit financing at all. Even when export credit financing is available, OECD rules limit coverage to 85% of permitted aircraft acquisition costs. The remaining 15% must be funded commercially. And, while export credit financing is available under OECD rules to support the sale and export of used aircraft equipment, the amounts involved have not been material on a historical basis.

³⁸ See P. Baggaley, "Higher Ratings for Airline Equipment Debt," Standard and Poor's, *Global Sector Review* p.17, August 1995.

effect of regulatory and corporate events—in this case the passage of the Reform Act and the clarification of Section 1110 - on the value of a firm's stocks (in this case, airline stocks) is well established.³⁹ The methodology involves looking at the performance of the share prices of the affected companies (airline stocks) around the immediate date of the regulatory change (or its announcement) after adjusting for general changes in stock market conditions (e.g., changes in the Standard & Poor's 500 Index).

Specifically, the Standard & Poor's index of airline stocks rose 3.43% in the week before the Reform Act's passage and 6.3% in the week following (i.e., a two-week return of 9.73% in the period immediately surrounding the Reform Act's passage). By comparison, the Standard & Poor's 500 index fell 0.9% in the week prior to the Act's passage and rose only 1.95% in the week following (a two-week return of 1.05%).

This analysis does not completely take into account the greater sensitivity of airline stock movements to movements in the market. In general, airline stocks—because of the highly cyclical nature of their cash flows—tend to fluctuate more than the market even under normal conditions. Thus, we need to calculate the *abnormal* increase in airline stock returns due to the Reform Act's passage, taking into account their relatively high sensitivity (or so-called "beta" sensitivity) to the market.

It is estimated that the two-week abnormal return on airline stocks (i.e., return above that normally expected) due to the passage of the Reform Act was of the order of 4.65%. That is, given an initial equity market valuation of the publicly traded airlines included in the Standard & Poor's airline index (American, Delta, Southwest and U.S. Air) of \$9.84 billion at the beginning of October 1994, a 4.65% increase in market values translates into a capitalized increase in future earnings/dividends for these airlines of \$442.8 million (or 4.65% x \$9.84 billion). (Appendix 2 explains the methodology used in calculating the abnormal returns on airline stocks.)

What is the precise source of the enhanced expected earnings for U.S. airlines as the result of the passage of the Reform Act's clarification of Section 1110 provisions as applying to airline creditors? One potential source of improved expected future profitability is a reduction in required interest spreads or "premiums" demanded by investors on airline bonds (over the risk-free rate) as a result of lower credit risk and liquidity risk exposures due to enhanced Section 1110 protection. Using the monthly prices and yields to maturity ("YTM") reported in the Standard & Poor's bond guides on all publicly traded (and reported) U.S. airline bonds to calculate an average YTM, and using the YTM of the 10-year U.S. government treasury bond as a risk-free benchmark, the mean monthly spreads of airline bonds fell from 2.41% to 2.33% in the year after the Reform Act's passage compared to the year before the Reform Act's passage (i.e., by 8 basis points).⁴⁰

³⁹ See J. Binder "Measuring the Effects of Regulation with Stock Price Data," *Rand Journal of Economics* pp. 167-183, 1985..

⁴⁰ The monthly average percentage spread (i.e., the spread divided by the level of 10-year U.S. government treasury bond yields) also fell from 0.267 in the year before the Reform Act's passage to 0.253 in the year following—a fall of 5.2% in the percentage spread. These are based on yield quotes available in monthly

It should be noted that the upgrade of airline debt and the commensurate reduction in financing costs attributable to the proposed Convention/Aircraft Protocol is likely to be significantly greater than the upgrade attributable to the Bankruptcy Reform Act's clarification of Section 1110 in the United States. Estimates of the impact of the latter on airline financing costs thus represent a highly conservative value in comparison with the possible impact of the proposed Convention/Aircraft Protocol. This is because the U.S. airlines in question were already rated investment-grade or close to investment-grade (i.e., BBB or BB) at the time clarifications of Section 1110 came into force, and their financing costs reflect no sovereign risk premiums.

By contrast, the proposed Convention/Aircraft Protocol would cover (as yet) unrated and non-investment-grade airlines and countries, so that the (upward) rating migration is likely to be much more dramatic.⁴¹

4.5 Global Airline Financing Cost Savings

Currently most airline purchases have to take place in U.S. dollars. This means that an airline must raise external funds by borrowing dollars directly—either through secured bank loans, leases, dollar-denominated bonds or export credit—or else borrow in its local currency and convert (or swap) those proceeds into U.S. dollars.⁴² Some airlines (particularly those from large, developed countries) have access to a full range of both U.S. dollar and local-currency financing, while others, because of size, stage of economic development, as well as concerns about legal and judicial systems of their home countries, only have access to dollar financing in the form of export trade credit and other trade-related guarantees. At present, the latter are mostly developing and emerging-market countries that find it difficult or costly to directly access either the commercial dollar loan or dollar bond markets either at low cost, or in some cases at any cost at all (i.e., they are completely rationed).

The objective of this section is to calculate hypothetical "what if" type financing cost savings that may result from a greater ability of airlines worldwide to use private (commercially priced) asset-backed financing as a result of the passage of the proposed Convention/Aircraft Protocol. This entails estimation of the interest cost savings per dollar of aircraft financing by moving

Standard & Poor's bond guides and reflect end-of-month yields. It should also be noted that these are unweighted (or simple) averages of all available bonds.

⁴¹ It might be noted that Canada announced and passed an amendment similar to Section 1110 of the U.S. Bankruptcy Code to their Bankruptcy Act in 1997. The proposed amendment, announced on June 7 and passed into law on July 1 was directly aimed at Canadian railroads. Using the same methodology on Canadian railroad stock, (as for the passage of the U.S. Bankruptcy Code on U.S. airlines stocks), it was found that after adjusting for movements in the market and the sensitivity of railroad stocks to movement in stock market returns in general (the "beta"), the Toronto Stock Exchange index of railroad stocks increased 1.07% in the week of the announcement of the Canadian Bankruptcy Act amendment (i.e., the week of June 5-June 12). However, the statistical significance of this reaction was very weak. (In particular, it is not statistically significant at the 90% confidence level.)

⁴² Developed country airlines also have potential access to dollar equity markets in order to raise additional external funds.

from relatively unsecured commercial borrowings to secured borrowings. In the absence of export credit, airlines, in particular those that are not government-owned, would have to rely largely on their own creditworthiness in raising funds. In such situations, collateral and security is crucial. Thus, to fully appreciate the potential gains from the proposed Convention/Aircraft Protocol, it is important to evaluate the gains for airlines of different countries by moving from a hypothetical scenario in which they had to raise funds at commercially unsecured rates versus secured rates. Of course, some airlines that remain nationalized -a status with select adverse economic implications beyond the scope of this study - may still enjoy sovereign guarantees, the value of which depends on the level of sovereign creditworthiness.⁴³ As will be seen, these hypothetical savings in many cases are impressively large. Nevertheless, it should be further noted that these calculated savings estimates are based on actual and currently projected purchases (deliveries) of aircraft to airlines. To the extent that the global adoption of asset-based financing principles gives existing airlines expanded access to capital markets and external finance, and even allows previously credit-rated airlines initial access to those markets, the estimated costs savings actually represent underestimates of the true potential gains from passage of the proposed Convention/Aircraft Protocol.

4.6 Dollar Financing Cost Savings

Some airlines—especially those from developed countries—already have commercial access to either U.S. dollar bank loans or U.S. dollar-denominated bond markets, or both. The adoption of the proposed Convention/Aircraft Protocol will potentially give these airlines greater commercial access, and the ability to lower their funding costs, as well as giving greater access to airlines from developing countries, who currently rely either on export-trade credit or sovereign guarantees or else are excluded completely from dollar bank loan and bond markets (e.g., the sovereign risk of the country or the credit risk of the privatized airline is too high in the perception of commercial lenders and investors).

4.7 Financing Cost Savings: Secured Loans in Unfavorable vs. Convention Conditions

The simplest way to see the potential for financing cost savings in the dollar loan market is to calculate the present value of the interest-cost savings from using secured dollar loan finance versus relatively unsecured dollar loan finance. The latter may reflect the cost of borrowing to an airline from a developing country dependent upon sovereign guarantees with relatively high sovereign risk ratings. The former rate may reflect creditworthy private airlines in jurisdictions with advanced secured transactions laws.

Many airline loans take the form of fully amortized mortgages (similar to residential mortgages) in which a constant repayment is made each period (year) comprising of interest and principal

⁴³ Recent adverse events in a number of developing markets underscore the point that governmental control of airlines, and even direct sovereign credit support of such airlines, is no assurance of low-cost financing. Lending rates to government-owned and/or supported airlines reflect the credit standing of the government guarantor. In a number of recent cases, that credit standing has been viewed by markets and risk assessors as unstable.

repayments. According to bankers,⁴⁴ a common maturity for an aircraft loan (mortgage) is 12 years. A hypothetical "secured loan" transaction - with minimal legal or political risks, a creditworthy borrower and a high collateral to debt ratio - might take place at around LIBOR plus 40 basis points,⁴⁵ whereas a hypothetical "unsecured transaction"⁴⁶ - assuming it is acceptable at all - might take place at LIBOR plus 250 basis points.⁴⁷ As noted earlier, some airlines have no commercial access at all, even with sovereign credit risk guarantees. In general, commercial lenders—for moral hazard and other risk reasons discussed earlier—are reluctant to charge exceedingly high rates, preferring instead to credit-ration such borrowers, although they may continue to have access to operating leases.

Exhibits 6a and 6b show one way of considering potential savings and savings ranges associated with the proposed Convention/Aircraft Protocol. They do so by indicating the present-value cost savings of interest payments on a secured loan financing of \$1 versus an unsecured loan financing of \$1 using various interest rate spreads above the average 1995 LIBOR rate plus 40 basis points and an assumed 12-year fixed-rate aircraft mortgage. These savings are computed on both a total (Exhibit 6a) and annualized (Exhibit 6b) basis. As can be seen, the savings increase with the size of the spread between the actual lending rate and the "secured lending rate" assumed to be LIBOR plus 40 basic points. For example, if the borrower in the relatively unsecured transaction had to pay a loan rate of LIBOR plus 140 basis points (or an extra spread over the secured rate of 100 basis points), it would save 5.8 cents per dollar (or 5.8%) of principal borrowed, over the life of a 12-year loan, by moving to a secured loan financing. This results in an average annual interest savings over the 12-year period of 0.48% of the principal borrowed. Thus, for a \$100,000,000 aircraft purchase, the annual average interest savings over the 12-year-life of a loan would have a present value of \$480,000 (with a total present value savings over the 12 year loan of \$5,800,000). A borrower currently paying LIBOR plus 90 basis points (or a spread over the secured rate of 50 basis points) would save 2.91 cents per dollar borrowed.

Underlying the approach employed in Exhibits 6a and 6b is the notion of *comparative improvement*. The actual cost savings in a particular country and to a particular carrier will principally depend upon the comparative improvement embodied in the proposed Convention/Aircraft Protocol judged against otherwise applicable national legal rules, and the

⁴⁴ We would like to thank Tom Gallagher of CIBC Wood Gundy for his input and advice as to the standard features of loan contracts for airline purchases.

⁴⁵ Unless noted otherwise, all references to the pricing or cost of a financing (e.g., LIBOR plus basis points) are to the overall costs on a per annum basis in a fixed-rate transaction.

⁴⁶ For our purpose it is immaterial whether the lack of security is *de facto* (as a result of the relevant legal and/or political risks) or *de jure* (as a result of the nature of the credit facility). The common point is that the value of collateral is not a central feature in the overall risk assessment in the transaction.

⁴⁷ These figures have been provided, and are being used herein, as reasonable indicators both of hypothetical secured and unsecured rates, as well as differentials between them. Actual rates and/or differentials may be higher or lower depending on a wide variety of factors.

relationship between legal and other perceived risks in a particular transaction. The greater the comparative improvement, the greater the benefit.

4.8 Financing Cost Savings: Secured Dollar Bonds vs. Unsecured Dollar Bonds

An alternative way to raise commercial dollar finance for aircraft procurement is to issue dollar-denominated bonds, either in the U.S. or in the Eurobond markets. Most bonds require periodic payment of coupon interest and a final (balloon) repayment of principal. By using asset-backed bond financing, an airline can potentially receive a higher credit rating from the rating agencies and thus can pay lower coupon rates on its bonds.

In this section we consider, again by analogy to current credit rating agency methodology, the potential benefits of the proposed Convention/Aircraft Protocol in connection with bond financing. The comments on comparative improvement made above, and early points relating to political and sovereign risk, apply here with equal force.

For example, depending on the degree of collateralization, Standard & Poor's will upgrade an aircraft equipment trust certificate subject to Section 1110 between two notches (where a notch is a plus or a minus) and three full rating categories depending on the degree of (over) collateralization of the asset backing the bond. Table 1 shows an example of a fixed rate 12-year asset-backed bond financing where the airline issuer has managed to achieve a one-category upgrade of its debt rating from AA to AAA. As a result, based on 1992-1995 average yield figures for these rating classes, the coupons on newly issued bonds might be expected to fall from 7.89% per annum (AA) to 7.59% (AAA). Over the 12-year life of the bond, the present value of the coupon or interest savings per \$1 of face value amounts to \$0.02 or two cents per \$1 of financings (or 0.16% per annum).

Exhibit 7 summarizes similarly calculated one-category rating upgrade savings, e.g., from CCC to B, from B to BB, etc. As can be seen, the cost savings are greatest for the lower (most risky) borrowers. Thus a one-category upgrade by a CCC borrower to B results in a present-value saving of 16 cents per \$1 of financing over the 12-year life of the bond. Thus on a \$100,000,000 purchase of an aircraft financed by a B-rated asset-backed bond issue, an otherwise CCC rated issuer might save \$16,000,000 in (present-value) interest costs over the life of a 12-year bond, or \$1,333,333 on an annual basis.

Exhibit 7 also shows potential savings per \$1 of more than one-category upgrades. This may be achieved when an equipment trust certificate is significantly over-collateralized. In the case of over-collateralization by 286%, three full category upgrades have been achieved. Thus an unsecured CCC airline issuing an asset-backed bond with this degree of collateralization (and Section 1110 application) might theoretically move up to BBB, i.e., to investment-grade status. As can be seen from Exhibit 7, this results in a present-value cost saving of 31 cents per \$1 of financing over 12 years (or an average annual saving of 2.6%). For a BBB-rated borrower, a three-category upgrade (to AAA) would result in a nine cents per \$1 present-value cost savings over 12 years (or an average annual saving of 0.75%).

Exhibit 8 provides an indication of the maturity structure of new emerging-market loans and securities issues during the period 1989-97. Note the far longer maturities of bond issues in recent years, rising to almost 12 years in 1997 as compared to about four years for bank loans. In all, about 50 countries were covered by the bond rating agencies in 1997 - a number that has been increasing steadily since the late 1980s, of which about half are rated below investment grade.

4.9 Per Dollar and Total Projected Cost Savings

In the preceding sections we have calculated *"what if" potential or hypothetical present-value cost savings* from asset-backed dollar and securitized financings versus unsecured dollar financings on a per-dollar basis over a fixed-rate, standard 12-year loan or bond financing. This is convenient, since an airline or country can always multiply the present-value cost savings per dollar by the amount it needs to raise in external loan or bond finance to support its particular aircraft acquisitions.

The "what if" or hypothetical potential figures for country-by-country aggregate dollar savings presented below are based on actual dollars spent on airline purchases during 1992-1997 and projected expenditures 1997-2016 provided by Airbus and Boeing. The calculations we make crucially assume the savings accrue because 100% of finance is achieved through one particular mechanism rather than another, e.g., fully secured dollar loans versus less heavily secured dollar loans.

To the extent that, for example, 15% or 30% or 75% of finance is achieved through a particular means, with other finance sources being used (e.g., equity, export credit financing, leasing) to finance the balance, the numbers in the following tables can be directly adjusted by multiplying these projected savings figures by the percentage of finance derived from a particular financing source. Because of the very wide differences in financing sources used by airlines—and the lack of precise country-by-country information on use of these sources—as between equity, bonds, export credit, loans and leasing, (as well as the existence in many cases of sovereign credit guarantees) we feel that this "what if" or hypothetical approach is the most useful as a benchmark for comparison across countries.

4.10 Hypothetical Savings for 1992-1997 Using Dollar Finance

In this section we take a very simple approach to calculating hypothetical financial savings. The approach assumes that commercial conditions prevail.⁴⁸ In addition, it is assumed that all (100%) of the necessary finance, for purposes of comparison, is raised with an average maturity of 12 years. To estimate the savings, we take actual dollars spent on aircraft acquisitions on a country-by-country basis during the 1992-1997 period and multiply these figures by the estimated cost savings if they had used 100% secured 12-year fixed-rate dollar borrowing versus relatively unsecured dollar borrowings for financing actual aircraft acquisitions (i.e., LIBOR plus 40 basic points versus LIBOR plus 90 basic points) plus a range of higher spreads.

⁴⁸ See, for example, part 4.3 above discussing the inapplicability of export credit financing to the methodology employed in this study.

These hypothetical costs savings for loans are shown in Exhibit 9. For example, if the weighted average loan spread for 1992-97 commercial aircraft deliveries were reduced from LIBOR plus 140 basis points to LIBOR plus 40 basis points (a spread savings of 100 basis points), the present-value savings would have been approximately \$12 billion (or on average \$1 billion annually over the life of the assumed 12-year loans). A spread reduction of just 50 basis points, i.e., from LIBOR plus 90 basis points to LIBOR plus 40 basis points would have resulted in total present-value savings on loan interest payments of over \$6 billion.

A commercial alternative to secured dollar loan finance is secured dollar bond finance. The savings in this case depend on the current rating of the airline borrower (or its home country if it is nationalized or subject to a sovereign credit guarantee) and the degree of over collateralization of the asset-backed bond. The 1996 Standard & Poor's rating of each country is shown in bold face in Table 2 so that it is easy to see the potential savings from one or more upgrades. Again it should be noted that these calculations are based on actual aircraft purchases, and not purchases that would have been possible due to greater loan and capital-market access had the proposed Convention/Aircraft Protocol been in effect at that time.

4.11 Projected Potential Savings for 1997-2016 Using Dollar Finance

Exhibit 10 repeats a similar exercise as in Exhibit 9, except that it takes projected aircraft acquisition expenditures for 1997-2016 (in 1997 dollars) as the amount of financing that will need to be raised.⁴⁹ Once more, a weighted average loan spread reduction from 140 to 40 basis points over LIBOR (or a spread reduction of 100 basis points) would cut financing costs by over \$62 billion on a present-value basis, or over \$5 billion annually for a 12-year financing. A spread reduction of just 50 basis points (from LIBOR plus 90 basic points to LIBOR plus 40 basic points) would result in present-value savings of over \$30 billion or approximately \$2.5 billion per annum for a 12-year financing. Table 3 repeats a similar analysis as Table 2 assuming bond finance of projected 1997-2016 aircraft savings over a 12-year financing for a one-rating upgrade (and multiple rating upgrades) for each country where ratings are available.

Again these are "what if" (hypothetical) savings based on commercial conditions prevailing, and 100% sourcing of the financing method. As noted earlier, these figures can be multiplied by any given smaller percentage (e.g., 15%) to generate scenarios in which funds (e.g., of the required amount) are raised largely through non-commercial mechanisms.

4.12 Summary of Financing Cost Savings

As indicated above, the hypothetical savings (on commercial terms) from the proposed Convention/Aircraft Protocol differs widely across countries depending on the comparative improvement, the other risks in particular transactions, and the applicable financial instruments. For example, being able to use secured dollar loans rather than relatively unsecured dollar loans may save an airline (in present-value terms) up to 5.8 cents per dollar financed if interest rates spreads are reduced by 100 basis points. The savings from dollar bond financings will differ by initial rating of the borrower (or the borrower's home country) and degree of over-collaterization

⁴⁹ Based on consensus forecast aircraft deliveries by Airbus and Boeing.

of the asset backing given to the bond financings. Hypothetical savings per dollar would vary between two cents per dollar for an upgrade from AA to AAA to 31 cents per dollar for an upgrade from CCC to BBB (or between 0.16% and 2.6% per annum). Moreover, airlines that currently lack access to such financing markets may have that access under the proposed Convention/Aircraft Protocol regime.

5. Estimates of Pass-Through, Transactions Cost and Fleet Planning Benefits

The primary microeconomic impact of the proposed Convention/Aircraft Protocol is the potential benefits that will accrue by virtue of the reduced cost of financing and the increased availability of credit for the acquisition and use of commercial aircraft from asset-based financing. The general order of magnitude of these benefits has been discussed in the previous section of this paper, and appears to be significant on a stand-alone basis. However, there are a variety of other benefits as well, most of which are much more difficult or impossible to quantify. These include pass-through benefits to passengers and other users of commercial air transport services. They also include lower transactions costs that come in the form of delays, professional fees, and resale prices of aircraft under distress conditions. Finally, gains attributable to improved efficiency in fleet planning and equipment allocation are particularly noteworthy. All of these comprise further types of microeconomic benefits that the proposed Convention/Aircraft Protocol would convey on various clusters of industry participants, whether aircraft operators or customers, suppliers or financiers.

5.1 Pass-Through Cost Savings to Passengers

A certain part of the financing cost gains realized by airlines will be passed on to passengers. The extent of the "pass-through" will depend upon applicable cost elasticities of supply and price elasticities of demand. The essential issue will be the relative sensitivity of the demand for air transport measured in terms, for example, of revenue passenger miles to a relative change in the real cost of air transport that represents a pass-through of the aforementioned financial cost reductions. Clearly, the higher the price elasticity of demand for airline services and the greater the pass-through of the cost savings benefits of the proposed Convention/Aircraft Protocol to the end users in lower fares, the greater the increase in demand for air transportation and for aircraft.

At this point, gauging the pass-through effects of financial cost savings attributable to the proposed Convention/Aircraft Protocol would be speculative depending critically, as it does, on the competitive structure of the various relevant markets for air transport services. However, based on estimates of the elasticity of airfares with respect to cost and the elasticity of demand for airline services with respect to fares, recent U.S. studies⁵⁰ have shown that every 1% reduction in airline costs can lead to between a 0.33% and 0.5% reduction in airline passenger

⁵⁰ See J.K. Brueckner & P.T. Spiller, "Economies of Traffic Density in the Deregulated Airline Industry" *Journal of Law and Economics* pp. 379-415, 1994; J.A. Brander & A. Zhang, "Market Conduct in the Airline Industry: An Empirical Investigation," *Rand Journal of Economics* pp. 567-583, 1990; and M. Peteraf & R. Reed, "Pricing and Performance in Monopoly Airline Markets," *Journal of Law and Economics* pp. 193-213, 1994.

fares. In turn, a 1% reduction in fares has been estimated to expand passenger demand for air travel by between 1.6% and 2.5%. This suggests that for every 1% estimated reduction in costs there could be between a 0.53% ($0.33\% \times 1.6\%$) and 1.25% ($0.5\% \times 2.5\%$) expansion in air passenger traffic. It is highly unlikely, however, that the aforementioned demand elasticities for air transport services would apply in other markets or in the various international markets served by the industry. No elasticity estimates are available that would allow a comprehensive assessment of the possible impact of the proposed Convention/Aircraft Protocol on the global volume of air transport.

However, if we assume that financing costs are, on average, somewhere between 10% and 20% of total airline operating costs, a 1% savings on such financing costs translates into between a 0.1% and 0.2% total cost reduction facing the air carrier. Consequently, using U.S. demand elasticity estimates, every 1% reduction in financing costs can be translated into a potential expansion of passenger air traffic of between .053% ($0.33\% \times 1.6\% \times 0.1\%$) and .25% ($0.5\% \times 2.5\% \times 0.2\%$). For example, a potential present-value reduction of 5.8% in financing costs by moving from unsecured to secured dollar loans over 12 years⁵¹ can be translated into a potential long-term increase in air passenger-kilometers traveled—assuming the above cost and demand elasticities—of between 0.31% ($5.8 \times 0.053\%$) and 1.45% ($5.8 \times 0.25\%$).⁵² Using 2,411 million passenger-kilometers as the 1996 basis for global airline demand, a cost reduction in this range could result in a long-term increase in the demand for airline services between 7.5 and 34.95 million passenger-kilometers once the full adjustment has taken place and assuming full pass-through of the financial cost savings.⁵³ This, of course, translates into a significant potential gain in global airline revenues.

5.2 Reductions in Transactions Costs

A further benefit to airlines (again with the possibility of pass-through to passengers and the associated volume effects) is the potential reduction in transaction costs - costs other than normal principal, interest and lease financing costs - most notably, legal and other professional costs. These types of transaction costs can be substantial, especially when (in addition to initial acquisition transactions) airlines frequently refinance existing obligations, redeploy aircraft equipment with affiliates or joint-venture entities and strategic alliance partners (an increasingly common pattern) for use in other regions, and/or sell or sublease aircraft equipment to third parties.⁵⁴ The potential cost savings in this regard flows from the general upgrade and harmonizing features of the proposed legal instruments, particularly to the extent that they lead

⁵¹For illustrative purposes, this is the hypothetical saving if secured loans reduce spread by 100 basis points (e.g., from LIBOR plus 140 basic points to LIBOR plus 40 basic points). See part 4.7 above.

⁵²These numbers can be annualized by dividing these figures by 12.

⁵³ Total passenger-kilometres travelled in 1996 are from ICAO, *Annual Civil Aviation Report 1996*, July/August 1997.

⁵⁴ In view of the wide transaction cost range - varying by market, efficiency in use of legal resources, and complexity of transaction structures - and lack of reliable data, specific estimates of cost savings would be speculative.

to simplified transaction structures and documentation accepted throughout the air transport industry.

Another category of transaction cost savings relates to the avoidance of "fire-sale" prices on aircraft sales. Such prices are a result of being financially constrained under condition of financial distress, i.e., selling aircraft at a discount to normal market prices.

In a recent study,⁵⁵ it was found that those U.S. airlines subject to financing constraints over the 1978-91 period tended to sell aircraft at significant (in this case 13%) discounts to normal values. Moreover, financially unconstrained airlines significantly increased their aircraft acquisition activity when aircraft prices were depressed—a pattern not observed for financially constrained airlines. To the extent that improved access to asset-based finance adds to the financial capacity and financial flexibility of airlines, this type of asset-sale transaction under conditions of financial distress cost can be increasingly avoided.

A further aspect of the potential reduction in transaction costs attributable to the proposed Convention/Aircraft Protocol is a reduction in a lender's opportunity costs due to litigation delays.

A simple example might be the case of a 10-year asset-backed bond used to finance the purchase of an aircraft. The cost of the aircraft is assumed to be \$100 million and the airline contributes an equity stake of 10% (i.e., banks or bondholders provide \$90 million in debt financing). Under a no-default scenario, the bondholders would expect to receive 20 semi-annual payments of coupon interest amounting to \$4,500 million and a final payment of \$90 million (the return of the principal on the bond). Assuming an annual discount rate of 8% (semi-annual discount rate of 4%), the present value of the bond would be \$102,232,350 with a gross return on the \$90 million lent by the banks or bondholders of 13.59% (Appendix 3 provides details of the relevant calculations).

Suppose, however, that the air carrier in this example defaulted on the loan interest or the bond's coupon payments in the middle of the seventh year, and it takes 30 months (two and a half years) for the bondholders' trustee to legally seize possession of the aircraft and to sell it for its market value (assumed to be \$90 million for simplicity). That is, the aircraft is finally sold in year 10 for \$90 million (which was the original principal amount lent to the airline). As a result, the present value of the cash-flows to the secured lenders or bondholders would fall to \$91,108,800 with a return of 1.23%. This lower value reflects lost interest payments (and the lost reinvestment income on those interest payments) during the 30 month period.

By comparison, if the specific expedited relief rule contained in the proposed Convention/Aircraft Protocol were in force in this hypothetical case and the aircraft could be legally seized and sold immediately (i.e., at the beginning of the 8th year for \$90 million) the present value of the cash flows on the secured loan or bond would have been \$98,083,800 with a return of 8.98%.

⁵⁵ See Todd C. Pulvino, "Do Asset Fire-Sales Exist?: An Empirical Examination of Commercial Airline Transactions," *The Journal of Finance*, Vol. 53, No. 3, June 1998.

In this example of a (30-month) legal delay, one avenue available to the secured lenders or bondholders (so as to avoid a sizable present-value loss) would be to rationally price such a "legal" risk in the applicable interest rate. However, as has been noted earlier, seeking to charge higher interest rates on secured loans or asset-backed debt issues may actually increase the default incentives of the borrower. As a result, banks and bondholders may prefer not to lend or buy the bonds at all (i.e., the airline would be rationed out of the capital market).⁵⁶

5.3 Benefits of Enhanced Fleet Planning Flexibility

In addition to microeconomic gains that find their origins in financial savings, the quantitative impact of the Convention/Aircraft Protocol in terms of their potential to increase short - and medium-term capacity at relatively low costs may prove to be equally as important. This category of benefit directly relates to the cyclical and seasonally influenced nature of the air transportation industry.

These legal instruments will be of significant, independent value to the extent they help provide airlines with the capacity "headroom" in boom periods of air transportation while minimizing the costs and risks of longer-term asset-acquisition commitments. This aspect of gain - i.e., maximize airline "lift" (the use of revenue-generating assets) and thus short - and medium-term profitability - will be of particular benefit to carriers with sophisticated operations. Larger markets for secondary or short-term transactions, and reduced costs of such transactions, have the potential of enabling airlines to obtain greater control over fleet planning, shifting deployment of assets through leases, sub-leases and asset -- transfers in effect rendering assets and airline fleets more liquid.⁵⁷ In broad terms, the proposed Convention/Aircraft Protocol - through its internationally standardized provisions embodying the asset based financing principles - may contribute to such market enlargement, cost reductions, and resulting fleet use, and planning efficiencies. Again, the prospective size of these effects and their impact on the operating economics of airlines is open to conjecture.

6. Macroeconomic Gains

In addition to the microeconomic benefits enumerated above, there are significant macroeconomic gains associated with the proposed Convention/Aircraft Protocol. These have to do with incremental levels of output and employment, more rapid economic growth, and specific impacts on such areas as international trade, tax revenues and levels of internal and external public-sector and private-sector debt.

⁵⁶ An alternative model for calculating the cost of repossession delays, along with relevant commentary, is presented in Appendix 4.

⁵⁷ A similar benefit to airlines through these legal instruments relates to efficiencies in the procurement and use of spare aircraft engines. Such benefits relate to reducing the legal risk arising under current law (and the inconsistency between current legal systems), and the resulting potential for more efficient spare engine pooling and swapping arrangements.

Macroeconomic gains are much more difficult to pinpoint than the microeconomic benefits. Any time there is a major improvement in the efficiency and growth of a central economic sector such as commercial air transport, there are bound to be *significant positive spillover effects* to the economic system as a whole, both domestically and internationally. Probable impacts include higher levels of aggregate economic activity and employment due to enhanced expenditures and improved resource allocation, higher levels of economic growth due to higher levels of capital formation and technological change, as well as favorable effects on the terms and/or balance of trade and levels of external indebtedness. Quantifying these macroeconomic gains in most of the main dimensions lie well beyond the scope of this paper, although the principal sources of these gains can be identified.

The macroeconomic significance of the commercial air transport industry in a national economy can be measured in a number of ways, all of which have both direct and indirect components.

Direct measures of macroeconomic impact attempt to specify the quantitative importance of the industry itself, while *indirect* measures take into account the vertical and horizontal linkage effects to industries that are suppliers, users, and otherwise complementary to the commercial air transport sector. Further indirect linkages may be ascribed to the incremental activity in a given industry that is attributable to commercial air carriers as suppliers to or customers of other industries and its knock-on effects on those industries' subsequent linkages to still others.

Assessment of these direct and indirect impacts involve statistical problems that center around the need to estimate economic input-output relationships—that is, how much each industry buys from, and sells to, every other industry. This also involves assessment of how much each industry in a national economy exports, and how much it imports. With appropriate data, which does not exist for most of the countries whose airlines are likely to benefit from the proposed Convention/Aircraft Protocol, it is at least theoretically possible to quantify the overall economic activity generated by improved availability and lower costs of commercial air transport services in a national economy.

6.1 Aggregate Output and Income

A key question is precisely how the macroeconomic impacts should be evaluated. The most obvious measure is the change in the volume of gross domestic product (GDP), measured either by an increase in the market value of output or by increased returns to factors of production in the form of salaries and wages, interest and dividends, and rents paid both by the commercial air transport industry itself and by all of the linked industries. In markets where prices for financial services and productive factors are freely determined by supply and demand in the market, this represents a defensible measure of economic contribution.

Unfortunately, input-output models and economic-activity multipliers are poorly developed in terms of statistical quality, especially in emerging-market countries, so that it is often difficult to obtain a defensible overall measure of the economic contribution of industries in such contexts.

6.2 Trade, Investment and Multiplier-Effects

Subsidiary measures of macroeconomic gains, important principally insofar as they are determinants of the other gains outlined in this part 6] are first, sectoral trade balance improvements and, second, enhanced private investment levels. The reason for their importance is that net exports and investments carried out by an industry can have economic impacts that greatly exceed their nominal amounts produced as a result of the national income "multiplier." That is, increases in net exports or investments undertaken by an industry generate income to productive factors, which is then re-spent by the recipients on goods and services, which generates further output and income in the recipient industries, which in turn is re-spent, and so forth—each time diminished only by the share of the incremental income that "leaks" into savings and into imports of goods or services.

6.3 Employment Effects

A third measure of the macroeconomic contribution of the proposed Convention/Aircraft Protocol that is closely but not perfectly related to gains discussed above is job creation. Jobs are almost always a major focus of economic impact analysis due to their political as well as economic importance, especially where unemployment and underemployment are particularly troublesome. This is likely to be the case in many of the countries whose airlines and manufacturers are prime beneficiaries of the proposed Convention/Aircraft Protocol. Unfortunately, the precise employment effects depend largely—through the employment/output ratio—on the overall effects on GDP, whose measurement suffers from the aforementioned difficulties, and even definitive estimates of global airline revenues as a measure of the gross value of industry output are unavailable.

6.4 Public-Sector Revenues, Fiscal Balance and Privatization

A fourth measure involves the generation of fiscal revenues, obviously a critical factor in maintaining and augmenting national social and economic infrastructures, improving social support levels, and generally augmenting the quality of life. During the period 1987-95, for example, the world's airlines obtained direct subsidies from governments of some \$1.57 billion plus net tax subsidies (e.g., tax-effects of depreciation and operating losses) of \$10.4 billion.⁵⁸

At the same time that the global airline business has become more competitive, there has been considerable rethinking of national ownership of commercial air carriers. The pioneering privatization was that of British Airways in the early 1980s. Exhibit 11 lists a number of airline privatizations over the last ten years in both developed and developing countries. A number of additional privatizations have been announced and in some cases, such as Lufthansa, residual government stakes have been sold to the public, completing the privatization process. In some cases, such as Air France, announced privatizations have been canceled with changes of government, although they may well be reconsidered at a later time.

⁵⁸ ICAO, Annual Civil Aviation Report 1996, *ICAO Journal*, July-August 1997, Table 5.

Privatized airlines must be commercially viable, and often require substantial restructuring by government before sale, or afterward by the new owners, in order to achieve that viability. Besides improved use of labor resources and operational changes, a commercially viable privatized airline requires access to equipment acquisition and use financing on competitive terms in order to minimize the weighted average cost of capital. The proposed Convention/Aircraft Protocol can, for the various reasons outlined above, clearly make a substantial contribution in this regard, and thus can incrementally and, in select circumstances, materially enhance airline privatization potential.

6.5 External Debt and Borrowing Capacity

A fifth measure, which is of great interest to many emerging-market countries, is the increased availability of private international financing that results in reduced levels of the government's outstanding sovereign debt. That debt may arise through use of sovereign guarantee-based financing and/or by virtue of national airline borrowing.

The greater reliance on asset-backed aircraft finance instruments made possible by the proposed Convention/Aircraft Protocol will, to varying degrees, divert financing that would otherwise require sovereign bank credits or sovereign international bond issues (or financing under sovereign guarantees) into the private sector. The extent to which that diversion is possible will depend on facts and circumstances relating to residual transaction risk. Consequently, either the sovereign external debt levels can be reduced (with commensurate reductions in debt-service burdens) or freed-up sovereign debt capacity could be used for other development purposes.

Table 4 indicates the flow of capital to the emerging-market countries of Asia and Latin America during the period 1980-96, reaching \$150.7 billion in 1996, almost all of which represented private capital flows—a number likely to have declined significantly in 1997 as a result of financial crises and currency turmoil in Asia. The table also shows that these countries gained \$83.2 billion in external reserves in 1996, although again the picture is likely to change in 1997 for the same reasons.

Against this background of external debt levels, Table 5 shows the ratio of airline borrowings over the 1995-97 period to the stock of that country's external debt outstanding in 1995 (where data are available from the World Bank's *Global Development Finance Report* (formerly the *World Debt Tables*). It is clear that, for rapidly developing countries such as China, Malaysia and Egypt, aircraft financing amounted to between 2% to 3% of external debt outstanding. Any significant use of asset-based financing as a substitute for sovereign credit in respect of these amounts will have a material positive effect on sovereign debt levels.

Table 6 extends the analysis by providing available data on the relationship of external borrowing of countries to the degree of country risk according to a number of different risk assessment approaches:

- A semiannual risk survey of banks by *Institutional Investor* magazine requesting responses that are subsequently weighted by the size of the bank and degree of sophistication of its risk-assessment system;

- A model of risk assessment developed by ING Bank of the Netherlands, which uses macroeconomic data to interpolate between emerging-market bond ratings;
- A country risk rating conducted periodically by the ICRG Group, which considers both economic and political risk variables; and
- A rating by *Euromoney* magazine that surveys an “expert” panel on the degree of country risk.

All of these alternative approaches produce country risk calibrations on a scale from 100 (lowest-risk) to 0 (highest-risk) for each country, although not all countries are uniformly represented in all of the surveys.

Table 6 divides external borrowing levels by GDP (Column D) in order to gauge the relative external borrowing-intensity of each country. It is then possible to calculate a (nonparametric) Spearman rank correlation between the external borrowing-intensities and the various country risk ratings, with the Spearman correlation coefficient falling on a scale between +1 perfect rank correlation through 0 (no correlation) to -1 perfect inverse correlation.

The actual Spearman rank correlation coefficients are generally negative: -0.40 for the *Institutional Investor* rankings, -0.39 for the ING model rankings, -0.27 for the ICRG rankings and -0.35 for the *Euromoney* ratings. These negative correlations imply that the higher the country risk rating (i.e., the less risky the country) the greater the level of its external borrowing, adjusted for the size of the economy. This suggests that certain financing-related benefits of the proposed Convention/Aircraft Protocol are likely to disproportionately benefit those countries generally considered to be higher-risk since lower-risk ratings will enhance their ability to attain secured financing.

6.6 Potential Growth Effects

The aforementioned measures of economic impact focus on the so-called *static* effects of an industry such as commercial air transport. They explain and calibrate how efficiently existing resources are used in a national economy in the context of the global market environment. This is only part of the story, however. There is also the (arguably even more important) issue of how an industry contributes to long-term economic growth. These so-called *dynamic* effects concern how rapidly the *capacity* of an economy to produce goods and services expands over time.

Consideration of the “supply side” of the national economies focuses on quantitative⁵⁹ and qualitative⁶⁰ dimensions of the labor force, the capital stock, the natural resource and energy base, and the level of technology.

⁵⁹ Relevant questions relating to the quantative dimension include the following. What determines the size of the labor force in terms of such underlying variables as demographics, migration, labor force participation rates, and hours worked? What determines the quality of the labor force in terms of investment in human capital, for example? Similarly, what are the main determinants of the formation of physical capital and infrastructure, including savings and investment rates and international transfers of real capital? How do natural resources enter

The commercial air transport industry can and undoubtedly does have a major impact on growth precisely because it incorporates an inherently high level of technology, and because it has an unusually significant impact on one of the major explanations of economic growth, total factor productivity.

By potentially reducing external financing costs and increasing financing availability, and thus the rate of new investment in the airline industry, the proposed Convention/Aircraft Protocol will expand, with potentially positive effects, on national and world economic output levels and growth rates. The legal upgrade represented by the proposed Convention/Aircraft Protocol has both direct and indirect causal relationships to the efficiency of national financial systems, on the one hand, and to increased capital flows and capital formation, on the other, leading to increased levels of economic activity as well as increased rates of economic growth.

7. Conclusions

This study has identified the micro economic and macroeconomic impact of the proposed Convention/Aircraft Protocol. It concludes that, to the extent adopted and effectively implemented, these proposed legal instruments will achieve significant economic gains. These gains will be widely shared among airlines and manufacturers, their employees, suppliers, shareholders, and customers, and the national economies in which they are located.

The economic gains will be substantial and complementary. On conservative assumptions, the gains are estimated at several billion dollars on an annual basis. Such gains are the foundation for any durable legal innovation capable of attracting strong, broad-based international support.

into the supply-side equation, both in terms of availability and in terms of the application of capital and technology in exploration, production and distribution? What determines the level of technology both in the abstract (including management and information technologies) and embodied in physical capital and human skills, focusing specifically on the role of R&D?

⁶⁰ Qualitative aspects include motivation, entrepreneurship and risk-aversion. This so-called *production function approach* to the supply side of national economies also involves international supply-side linkages in human resources, capital, natural resource and technology flows, as well as corporate restructuring, mergers and acquisitions, and the market for corporate control, insofar as it affects (and is affected by) national and international economic performance.

APPENDIX 1

Précis of Proposed Unidroit Convention on International Interests in Mobile Equipment as applicable to aircraft equipment through the Aircraft Equipment Protocol*

- 1 Nature of Legal Instruments. Unidroit has transmitted to its member States a preliminary draft Convention on International Interests in Mobile Equipment (**Convention**). While the proposed Convention will cover a wide range of mobile equipment, it will only apply in respect of a particular category of equipment at such time as a protocol relating to that category comes into force.

A protocol will modify the Convention as relates to the category of equipment covered by that protocol.

A preliminary draft protocol (**Aircraft Protocol**) relating to airframes, aircraft engines and helicopters (**Aircraft Equipment**) has also been transmitted by Unidroit to its member States. The Convention, as modified by the Aircraft Protocol, will be referred to as the **Convention/Aircraft Protocol**.

- 2 Basic Convention Rules. The Convention/Aircraft Protocol will contain the following basic rules:
 - (a) Rights of Equipment Financier/Lessor. A mortgagee/chargee under a security agreement (**Chargee**), a seller under a conditional sales/title reservation agreement (**Conditional Seller**), or a lessor under a leasing or subleasing agreement (**Lessor**) (collectively, **Equipment Financier/Lessor**) whose rights are set forth in a document satisfying select criteria,¹ may do the following.
 - (i) First, upon the occurrence of any default or other event (**Remedies Event**) agreed to with its counterparty (**Equipment User**), an Equipment Financier/Lessor may exercise a set of basic remedies (as summarized in point 2(b), **Basic Remedies**) unless

* This précis has been prepared by Jeffrey Wool, chairman of the Aircraft Protocol Group. The Aircraft Protocol Group was created, at the invitation of the President of Unidroit, to prepare a draft of the Aircraft Equipment Protocol to the proposed Unidroit Convention on International Interests in Mobile Equipment. The sole purpose of this précis is to facilitate, and provide a framework for, the INSEAD/New York University Economic Impact Assessment. The explanatory notes to this précis are set forth in the attached addendum.

This précis is based on the versions of the preliminary draft Unidroit Convention (Unidroit 1998 Study LXXII - Doc. 42) and Aircraft Equipment Protocol (Unidroit 1998 Study LXIID - Doc. 3) dated July 1998. These documents have been officially transmitted to governments for their consideration.

Select terms and phrases used in this précis do not necessarily correspond with those employed in the proposed legal instruments. Rather, this document has been prepared as a simplified, stand-alone summary for reference by government officials, whether economists, legal and treaty experts, or aviation specialists, in connection with their review of the INSEAD/New York University study.

and to the extent that such remedies are excluded² by the Equipment Financier/Lessor and Equipment User (collectively, **Transaction Parties**) in their transaction documents. Such rule shall be referred to as the **Basic Remedies Rule**.

- (ii) Secondly, an Equipment Financier/Lessor may register its interest under the agreement against the relevant aircraft equipment in an international registry system (**International Registry System**).³ By so registering, the Equipment Financier/Lessor shall have a claim against the relevant Aircraft Equipment ranking in priority⁴ to any and all other interests not previously registered in the system *except only* preferred non-consensual creditors (as summarized in point 2(c), **Preferred Non-Consensual Creditors**). Such rule shall be referred to as the **General Priority Rule**.

- (b) Basic Remedies. The Basic Remedies⁵ available to a Chargee,⁶ upon the occurrence of a Remedies Event, enable it to (i) take possession of the aircraft equipment, (ii) deregister⁷ (from the relevant nationality register) and export the Aircraft Equipment, (iii) sell or grant a lease of the Aircraft Equipment, (iv) collect or receive income rising from the management or redeployment of the Aircraft Equipment and (v) apply any funds received pursuant to the remedies listed in clauses (iii) and (iv) above against the amounts secured.

The Basic Remedies available to a Conditional Seller or Lessor are, in addition to the ability of the Conditional Seller or Lessor to terminate the agreement, the rights referred to in clause (i) (taking possession) and clause (ii) (deregistration and export) of the previous paragraph. The inclusion of the rights referred to in clause (iii) (selling or leasing), clause (iv) (collection of income and proceeds) and clause (v) (application of proceeds) were thought to be unnecessary.⁸

- (c) Preferred Non-Consensual Creditors. Preferred Non-Consensual Creditors will be the only creditors that will not be required to register in the International Registry System in order to have priority over the registered rights of Equipment Financiers/Lessors. Preferred Non-Consensual Creditors are the classes of non-consensual creditors (e.g., materialmen and tax creditors), if any, that are (i) not subject to registration requirements under national law in order to establish their preferred position and (ii) designated as such by their respective Contracting States during the Convention/Aircraft Protocol ratification process (to the extent so designated).⁹
- (d) Treatment in Bankruptcy. The registered interest of an Equipment Financier/Lessor shall be valid against the Equipment User's trustee in bankruptcy, liquidator or administrator.¹⁰ This rule shall not affect special rules of insolvency law.¹¹
- (e) Assignments. The Equipment User will be bound by the terms of an assignment of the Equipment Financier's/Lessor's rights and interests in compliance with the Convention/Aircraft Protocol. Where such assignment is by way of security, the assignee will have Basic Remedies (against the assigning Equipment Financier/Lessor) analogous to those listed in point 2(b). The rule summarized in point 2(d) shall also apply as between the assignee of an Equipment Financier/Lessor and the latter's trustee in bankruptcy, liquidator or administrator.

- (f) Sales/Transfers of Title. A purchaser of Aircraft Equipment complying with the Convention/Aircraft Protocol, including its registration requirements, shall acquire such property free of all interests not previously registered (except Preferred Non-Consensual Creditors to the extent applicable). Conversely, a purchaser of Aircraft Equipment shall acquire such property subject to any interests previously registered. The rule summarized in point 2(d) also applies as between the purchaser of Aircraft Equipment and the seller's trustee in bankruptcy, liquidator or administrator.
 - (g) Jurisdiction. Courts in the jurisdiction of the Equipment User or, possibly, the Equipment Financier/Lessor,¹² the country of nationality registration, and the location of the Aircraft Equipment will have jurisdiction to resolve disputes arising under the Convention/Aircraft Protocol¹³.
- 3 Optional Convention Rules. The Convention/Aircraft Protocol will contain the following rules (**Optional Convention Rules**) which will apply if, and only if, (a) the relevant Contracting State¹⁴ has not entered a reservation in respect of the same at the time of ratification¹⁵ of the Aircraft Protocol and (b) the Transaction Parties have not excluded the applicability of such rules in their transaction documents:
- (a) Nonjudicial Remedies Rule. The Basic Remedies¹⁶ available upon the occurrence of a Remedies Event shall (with limited exceptions) be exercisable without the necessity of judicial process, assistance or intervention. This provision shall be referred to as the **Nonjudicial Remedies Rule**.
 - (b) Expedited Relief Rule. An Equipment Financier/Lessor who adduces *prima facie* evidence that a Remedies Event has occurred shall be entitled to expedited judicial and related relief. Such expedited relief, to be available prior to a full trial on the merits of a dispute,¹⁷ shall not affect the ultimate liability of the Transaction Parties as determined in a full trial. The forms of such relief are broad, including¹⁸
 - (i) immobilization of the Aircraft Equipment, (ii) preservation of the Aircraft Equipment or its value, (iii) possession, custody or management of the Aircraft Equipment, (iv) deregistration and export of the Aircraft Equipment, (v) sale or lease of the Aircraft Equipment, and (vi) application of proceeds or income relating to the Aircraft Equipment.

[[N.B.: The expedited relief rule is contained in Article 15 of the proposed Convention. In drafting modifications to that rule through Articles IX(1) and X of Aircraft Protocol, the Aircraft Protocol Group assumed that the remedies listed as items (1) and (6) in the preceding paragraph would be *cumulative*. Subsequent development of the text, however, has raised questions as to whether such remedies, as set out in Article 15 of the Convention, are intended to be cumulative. If they are not, governments should consider whether further modifications through the Aircraft Protocol are required to reflect the original intent of the Aircraft Protocol Group.]]

This general provision will require that such relief be available on a "speedy" basis. Contracting States will be given the opportunity to supplement this provision with a binding definition of "speedy relief" that establishes a timetable not to exceed 30/60 days¹⁹ from the date such relief is sought. This general rule shall be referred to as the

General Expedited Relief Rule, and such rule as supplemented by the binding timetable as the **Specific Expedited Relief Rule**.

- (c) International Insolvency Rule. Within a specified time of an insolvency event²⁰ of the Equipment User, the Equipment User must either (i) cure all defaults under the transaction documents or (ii) return the Aircraft Equipment to the Equipment Financier/Lessor. In addition, the obligations of the Equipment User to the Equipment Financier/Lessor may not be restructured, amended or modified in the context of insolvency proceedings without the consent of the Equipment Financier/Lessor. The specified timetable is the lesser of (a) 30/60²¹ days and (b) such shorter period, if any, under national insolvency law in which the Equipment User is required to cure all default or return the aircraft equipment to the Equipment Financier/Lessor. This provision shall be referred to as the **International Insolvency Rule**.²²
 - (d) Contractual Choice-of-Law Rule. The Transaction Parties may select the body of law to govern their respective contractual²³ rights and obligations. This provision shall be referred to as the **Contractual Choice-of-Law Rule**.
- 4 Perspective Denouncements and Withdrawals. While a Contracting State may denounce (i.e., withdraw from) the Convention/Aircraft Protocol, or the application of one or more of the Optional Convention Rules, pursuant to the procedures set forth in the text, no such denouncement will affect previously established rights and interests.²⁴

ADDENDUM

EXPLANATORY NOTES

1. The relevant agreement must (a) be in writing, (b) relate to aircraft equipment in respect of which the Equipment Financier/Lessor has power to enter into the agreement, (c) identify the Aircraft Equipment, and (d) in the case of a security agreement, identify the secured obligations.
2. As between themselves, the Transaction Parties may exclude or vary most of the rules contained in the Convention/Aircraft Protocol that relate exclusively to their relations. That would not prevent application of the Convention/Aircraft Protocol to the rights and interests of third parties.
3. The International Registry System will be asset-based. Registrations and searches will be made, separately, by reference to the manufacturer's serial number of airframes, aircraft engines and helicopters. A registration pursuant to the Convention/Aircraft Protocol will have effect in all Contracting States. Such registration will supersede the relevant requirements under national law relating to the perfection of property interests in aircraft equipment. It will not, however, impact the Chicago Convention of 1944 (**Chicago Convention**) nationality of an aircraft or helicopter.
4. A registration will be effective only when it has been assigned a sequentially ordered registration number that, together with that registration, is searchable within the system. Thus, an Equipment Financier/Lessor will be able to ascertain, prior to entering into a transaction, with certainty whether any parties (other than Preferred Non-Consensual Creditors) in any Contracting States have superior rights or claims against the relevant aircraft equipment.
5. These Basic Remedies will not limit the availability of any other remedies, including those agreed to by the Transaction Parties, permitted under applicable law and otherwise consistent with the Convention/Aircraft Protocol.
6. The method by which the Basic Remedies are exercised, except as noted in the next sentence, will be determined by the procedural law of the Contracting State in which remedies are so exercised. *See*, however, points 3(a) and (b) which, if applicable, permit the by-passing of court procedures or the setting of timetables for such court procedures, respectively.
7. The Chicago Convention states that (a) an aircraft cannot be validly registered in more than one country at any one time and (b) the country in which an aircraft is registered for nationality purposes may establish its own rules regarding the transfer of registration from its nationality registry. The Basic Remedies will thus include a reference to Chicago Convention-purpose deregistration of an aircraft/helicopter. This is an essential element of any effective exercise of remedies.

8. The reasoning is that, except in select common law systems, the ownership of an asset necessarily implies the right to sell or lease the asset, and that specifying these rights might have the undesirable consequence of limiting or qualifying broad ownership rights.
9. In making such designations, Contracting States may limit the extent to which any designated category will be preferred. By way of example, a class of nonconsequential creditors (e.g., tax creditors) may be preferred up to a specified amount or percentage of their claim.
10. This is an important yet limited concept. "Validity" is intended to ensure that the proprietary nature of the security, title retention or leasing interest represented by a registration will not be (a) set aside because its form would not otherwise be recognised in a particular Contracting State or (b) subordinated because of a failure to comply with otherwise applicable national "perfection" requirements. It is limited because it does not address the crucial timing or debt restructuring issues relating to insolvency proceedings. Such matters are addressed in point 3(c), if applicable.
11. The Convention/Aircraft Protocol will not address fraudulent/preferential transfers rules applicable in bankruptcy. Rules against fraudulent transfers seek to prevent transactions at an undervaluation or which otherwise are made in an effort to injure creditors generally. Rules against preferential transfers seek to prevent transfers which would favor one creditor at the expense of others. Under the laws of some countries, these two rules are merged. Both types of rules typically apply when a transferee is insolvent or is rendered insolvent by virtue of the subject transfer.
12. The draft Convention contains two alternatives on this point. The first would have jurisdiction reside with courts in the jurisdiction of the Equipment User. The second would have jurisdiction reside with courts in the jurisdictions of either Transaction Parties.
13. Matters relating to jurisdiction under the Convention/Aircraft Protocol will undoubtedly be the subject of detailed intergovernmental analysis and consideration.
14. The Contracting State that is relevant for these purposes will depend upon the specific issue. For the rule set forth in point 3(a), it is the Contracting State in which the remedies are exercised against the Aircraft Equipment. For the rule set forth in point 3(b), it is the Contracting State where the judicial relief is sought. For the rule set forth in point 3(c), it is the Contracting State in which the central insolvency proceedings are taking place. For the rule set forth in point 3(d), it is the Contracting State in which the litigation is occurring.
15. A Contracting State that has made one or more reservations relating to an Optional Convention Rule may subsequently withdraw that reservation. A withdrawal would render the relevant Optional Convention Rule applicable to transactions entered into after the effective date of that withdrawal. As to the nonretroactivity of future reservations in respect of Optional Convention Rules, see point 4.

16. In respect of the Basic Remedy of Chicago Convention de-registration, the Aircraft Protocol will include a provision sanctioning the use of a form of international irrevocable deregistration authorization. This would be the functional equivalent of a nonjudicial type remedy.
17. This provision, an important *innovation* specifically designed to facilitate asset-based financing and leasing, is independent of national provisional or injunctive relief laws or standards (which may include a high degree of judicial discretion).
18. This provision will not limit the availability of any other forms of interim or injunctive relief available under applicable law.
19. The precise number of days in which this judicial relief must be granted will require further consideration.
20. In addition to the commencement of traditional insolvency or bankruptcy proceedings, an "insolvency event" will also include declarations of nonpayment to creditors generally.
21. The same point made in explanatory note 19 applies in this context.
22. There will also be an Optional Convention Rule pursuant to which Contracting States, other than the Contracting State in which the central insolvency proceedings are occurring, may agree to cooperate with the central insolvency Contracting State in the application of the International Insolvency Rule.
23. The Convention/Aircraft Protocol deals generally with property (proprietary) rights. This provision, in contrast, addresses contractual matters such as the interpretation and construction of, and performance under, the transaction documents, as well as damages for breach thereof.
24. This provision is designed to minimize political/legal risks in the broad sense, that is, it permits reliance on the legal rules in effect at the time of the relevant transaction.

APPENDIX 2

Event Study Methodology

To calculate the abnormal return on airline stocks over the weeks ending October 21 and October 28th 1994, the weekly S & P return on airline stocks (SPAIR) is regressed on the weekly returns on the S and P index (SPX) over the two year period September 1993 to October 1995 (or 102 weeks). The normal or expected sensitivity of airline stocks to the movement in the market index—the so-called β or beta—is estimated as the slope of the linear regression of airline stock returns on the return on the stock market index over the two year period. The abnormal returns in the two weeks surrounding the event (the passage of the Bankruptcy Reform Act of October 22, 1994) is calculated as the slope of the regression of SPAIR on a dummy variable (Dummy) that is set equal to 1 for the weeks October 21st and October 28th 1994 and equal to zero for all other weeks in the two year regression period. The result of this regression are reported below:

$$\text{SPAIR} = -0.49 + 1.32\text{SPX}^* + 4.65 \text{ Dummy}^*$$

The * denotes that the coefficient is statistically significant at the 95% level.

Interpreting the regression, the coefficient on SPX is the "beta" of airline stocks which is equal to 1.32. That is a 1% increase (decrease) in the stock market index normally leads to 1.32% increase (decrease) in the returns on airline stocks. The coefficient on Dummy is the "abnormal" return on airline stocks in the two weeks surrounding the passage of the Bankruptcy Reform Act after controlling for movements in the market index over those two weeks. The value of 4.65% is the number reported in the text.

APPENDIX 3

The Effects of Litigation Delays on Bondholder Returns (10 year Semi-Annual Coupon Paying Bond)

Case 1. No Default

In this case the PV of the bond is:

$$PV_{\beta} = \sum_{i=1}^{20} \frac{\$4,500,000}{(1 + .04)^i} + \frac{\$90,000,000}{(1 + .04)^{20}}$$

which has a value of \$102,232,350 or a 13.59% return on the original \$90,000,000 loan

Case 2. Default after 7½ years and a 2½ year (30 month) litigation delay in seizing the asset

In this case:

Install Equation Editor and double-click here to view equation.

which has a value of \$91,108,800 or a return on the original bond principal lent of 1.23%.

Case 3. Default after 7½ years and Sale of the Airline Collateral at the beginning of year 8

$$PV_{\beta} = \sum_{i=1}^{15} \frac{\$4,500,000}{(1 + .04)^i} + \frac{\$90,000,000}{(1 + .04)^{16}}$$

In this case the present-value of the bond would be \$98,083,800 or a return on the original principal of 8.98%.

APPENDIX 4

The Problem of Aircraft Repossession Delays

An interesting model of the impact of aircraft repossession delays has been proposed, as follows:¹

Assumptions:

- One aircraft financed at 100% fully amortized over 12 years (equal principal repayments).
- Aircraft future market values are assumed to depreciate over 20 years down to a residual value of 10%.
- We assume that default occurs at year 5 in the example. We then compute the potential loss for various delays between default and repossession/resale (1 to 5 years in the example).
- In the example, interests continue to run at the nominal loan rate after default, and accrued interests have to be added to the principal outstanding at year 5. Thus, the total amount (principal + interest) has to be recovered from aircraft sale.
- No remarketing costs, no maintenance costs, and no aircraft checks are taken into account in this example.
- The objective of the model is to evaluate the extra margin that would be required on the loan in a weak legal system (3, 4, 5 years of repossession) compared to the loan with one year of repossession assumed to be representative of a "good" legal system.
- Margin is computed in order to offset the NPV of the loss at time of default (see computations attached).
- In this example, Δ margin is:
152 bp for 3Y
294 bp for 4Y

However those results are based on a 100% probability of default at year 5.

If we assume that an airline is being financed under a BB rating and that the probability of default over the period is an average 25%, we then take only $\frac{1}{4}$ of the Δ margin: 40 bp (3Y)/75 bp (4Y). Those numbers are larger than the 10 bp of section 1110 but less exaggerated than 210 bp (250bp-40bp).

¹ Claude Poulain, Finance Division, SNECMA.

Assessment

It is possible to evaluate the appropriateness of such a model of the impact of repossession delays (henceforth referred to as the benchmark model) for aircraft financing. The goal is to check the robustness of the results with respect to assumptions of the model. Our main conclusion is that the model employed is quite specialized, and we are unable to comment on its applicability in other contexts in which the assumptions do not hold.

The assumptions that we examine are:

1. Equal principal repayments are assumed in each year. We examine the fairly common alternative of fully amortized loans with equal payments at each period.
2. The way in which actual probability of default is used. The model multiplies the interest rate obtained with the probability of default. We instead multiply the NPV loss at the time of default by the probability of default. In year 0, this is the expected NPV loss in year 5 (see Table A-1).
3. The model considers the accrued interest on principal outstanding. However, the loss in the event of default for the lender is not only the principal outstanding, but also the future interest payments. Therefore, in computing the NPV loss, we take the present value in year 5 of all subsequent payments that would have been paid in the absence of default. This is equivalent to taking the present value in year 5 of the NPV from the aircraft sale in year 8 and discounting it at 8% and subtracting the amount of principal owed in year 5 (see Table A-1).

The calculations are summarized in Table A-2 and Exhibit A-1. The main results are:

1. The different structure of payments changes the full default case. The spreads that we obtain are considerably different from those in the benchmark calculations. Changing assumptions 1 and 3 clearly affects the results substantially. The magnitude of the difference for the two benchmark cases of sure default and delays of 3 and 4 years are as follows:

	3 years	4 years
Benchmark model	152 bp	294 bp
Our model	432 bp	590 bp

1. The difference in usage of default probability does not change the results very much, except when repossession is in year 10. In this case, the spread obtained by multiplying the probability of default with the sure default case is 2.77% versus our results of 2.90% for the CCC rated company. The difference in spreads calculated by the two different methods becomes small as the credit rating of the company increases.

Table A-1
Benchmark Model Calculations

Interest 8%			
Year	Principal Outstanding	A/c Future Value	Default @ Y5 - Sale@ Y6/Y7/Y8/Y9/Y10
0	100.000	100.000	100.000
1	92.667	95.500	91.667
2	83.333	91.000	83.333
3	75.000	86.500	75.000
4	66.667	82.000	66.667
5	58.333	77.500	58.333
6	50.000	73.000	63.000
7	41.667	68.500	68.040
8	33.333	64.000	73.483
9	25.000	59.500	79.362
10	16.667	55.000	85.711
11	8.333	50.500	
12	0.000	46.000	
13		41.500	
14		37.000	
15		32.500	
16		28.000	
17		23.500	
18		19.000	
19		14.500	
20		10.000	

Sale@ Y8		Premium: 1.52%
Year	Principal Outstanding	Diff. int.
0	100.000	1.516
1	91.557	1.389
2	83.333	1.263
3	75.000	1.137
4	66.667	1.010
5	58.333	
Loss @ Y8		9.483
NPV Loss @8%		5.12
NPV Diff. int. @ 8%		5.12

Sale@ Y9		Premium: 2.94%
Year	Principal Outstanding	Diff. int.
0	100.000	2.942
1	91.557	2.697
2	83.333	2.452
3	75.000	2.207
4	66.667	1.962
5	58.333	
Loss @ Y9		19.862
NPV Loss @8%		9.94
NPV Diff. int. @ 8%		9.94

Table A-2
Model Comparisons

yrs to end val deprec pa		20 beg val 4.5 end val		100 R= 10 r=		13.26950169 8.0000%
Loan amt	Payment	Interest	Principal	Ending balanc	a/c future val	
						100
1	100	13.26950169	8	5.269501692	94.73049831	95.5
2	94.73049831	13.26950169	7.578439865	5.691061828	89.03943648	91
3	89.03943648	13.26950169	7.123154918	6.146346774	82.89308971	86.5
4	82.89308971	13.26950169	6.631447176	6.638054516	76.25503519	82
5	76.25503519	13.26950169	6.100402815	7.169098877	69.08593631	77.5
6	69.08593631	13.26950169	5.526874905	7.742626787	61.34330952	73
7	61.34330952	13.26950169	4.907464762	8.36203693	52.98127259	68.5
8	52.98127259	13.26950169	4.238501808	9.030999885	43.95027271	64
9	43.95027271	13.26950169	3.516021817	9.753479876	34.19679283	59.5
10	34.19679283	13.26950169	2.735743427	10.53375827	23.66303457	55
11	23.66303457	13.26950169	1.893042765	11.37645893	12.28657564	50.5
12	12.28657564	13.26950169	0.982926051	12.28657564	1.19016E-13	46

	yr6	yr7	yr8	yr 9	yr10
	(\$1.02)	(\$7.05)	(\$12.44)	(\$17.25)	(\$21.54)
	\$0.00	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	(\$1.49)	(\$10.36)	(\$18.28)	(\$25.35)	(\$31.65)
	\$0.25	\$1.77	\$3.12	\$4.32	\$5.40
	0.14	0.15	0.16	0.18	0.19
% of default	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

our model

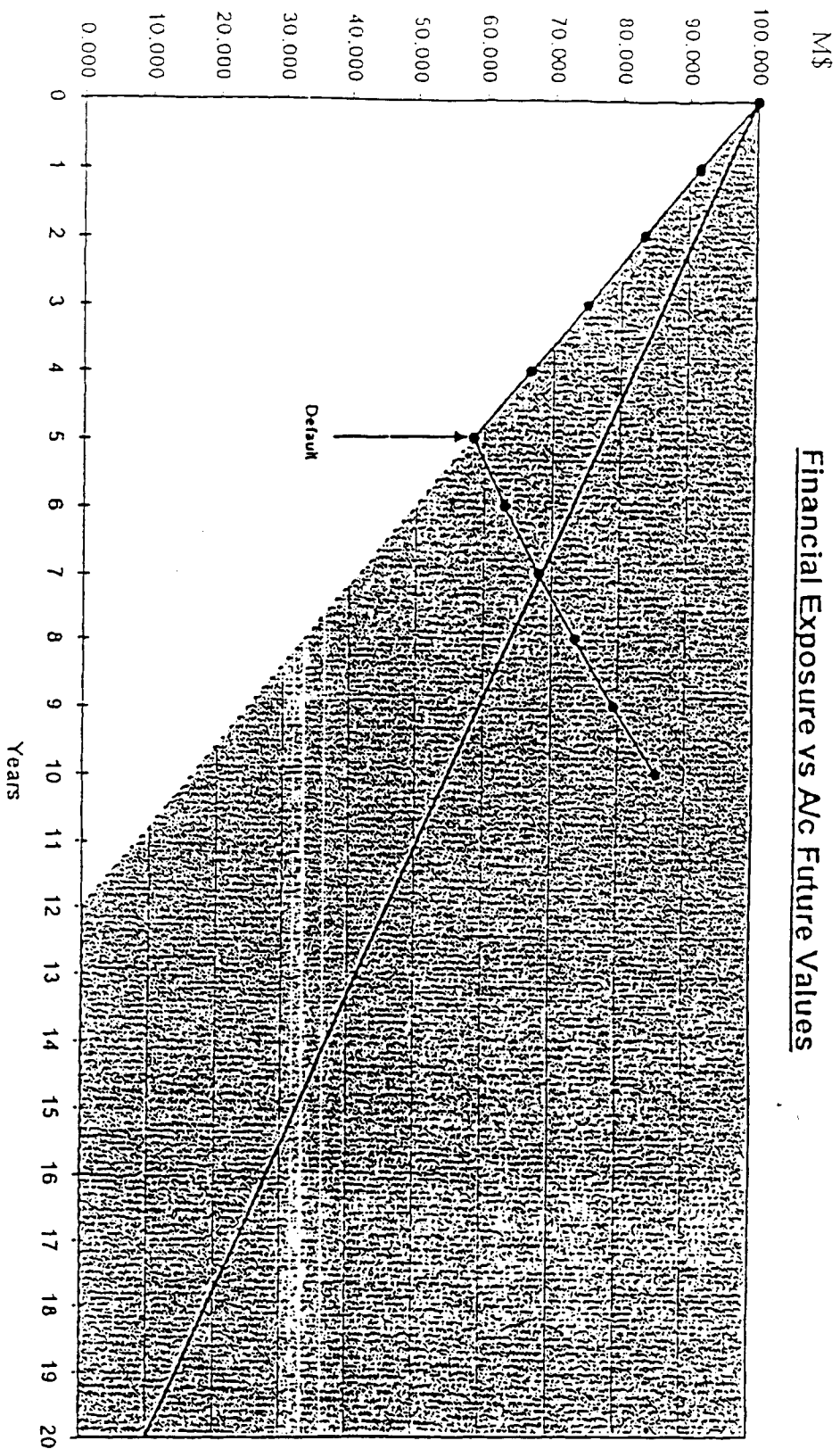
sure	100%	8.36863%	10.49644%	12.32235%	13.90166%	15.27502%
AA	0.40%	8.00131%	8.01026%	8.01796%	8.02498%	8.03122%
A	0.65%	8.00229%	8.01653%	8.02931%	8.04065%	8.05079%
BBB	1.90%	8.00692%	8.04867%	8.08588%	8.11902%	8.14868%
BB	11.30%	8.04172%	8.28909%	8.50900%	8.70433%	8.87767%
B	23.90%	8.08831%	8.60930%	9.06968%	9.47673%	9.83648%
CCC	38.20%	8.14112%	8.96979%	9.69784%	10.33803%	10.90148%

benchmark (with sure default prob. from our model)

% of default						
AA	0.40%	8.0015%	8.0100%	8.0173%	8.0236%	8.0291%
A	0.65%	8.0024%	8.0162%	8.0281%	8.0384%	8.0473%
BBB	1.90%	8.0070%	8.0474%	8.0821%	8.1121%	8.1382%
BB	11.30%	8.0417%	8.2821%	8.4884%	8.6669%	8.8221%
B	23.90%	8.0881%	8.5967%	9.0330%	9.4105%	9.7387%
CCC	38.20%	8.1408%	8.9536%	9.6511%	10.2544%	10.7791%

Exhibit A-1

Financial Exposure vs A/c Future Values



Principal Outstanding — A/c Future Value —●— Default @ Y5 - Sale @ Y6 / Y7 / Y8 / Y9 / Y10

Source: SNECMA, 10/31/97

Exhibit 1

Financing Alternatives Available to Airlines

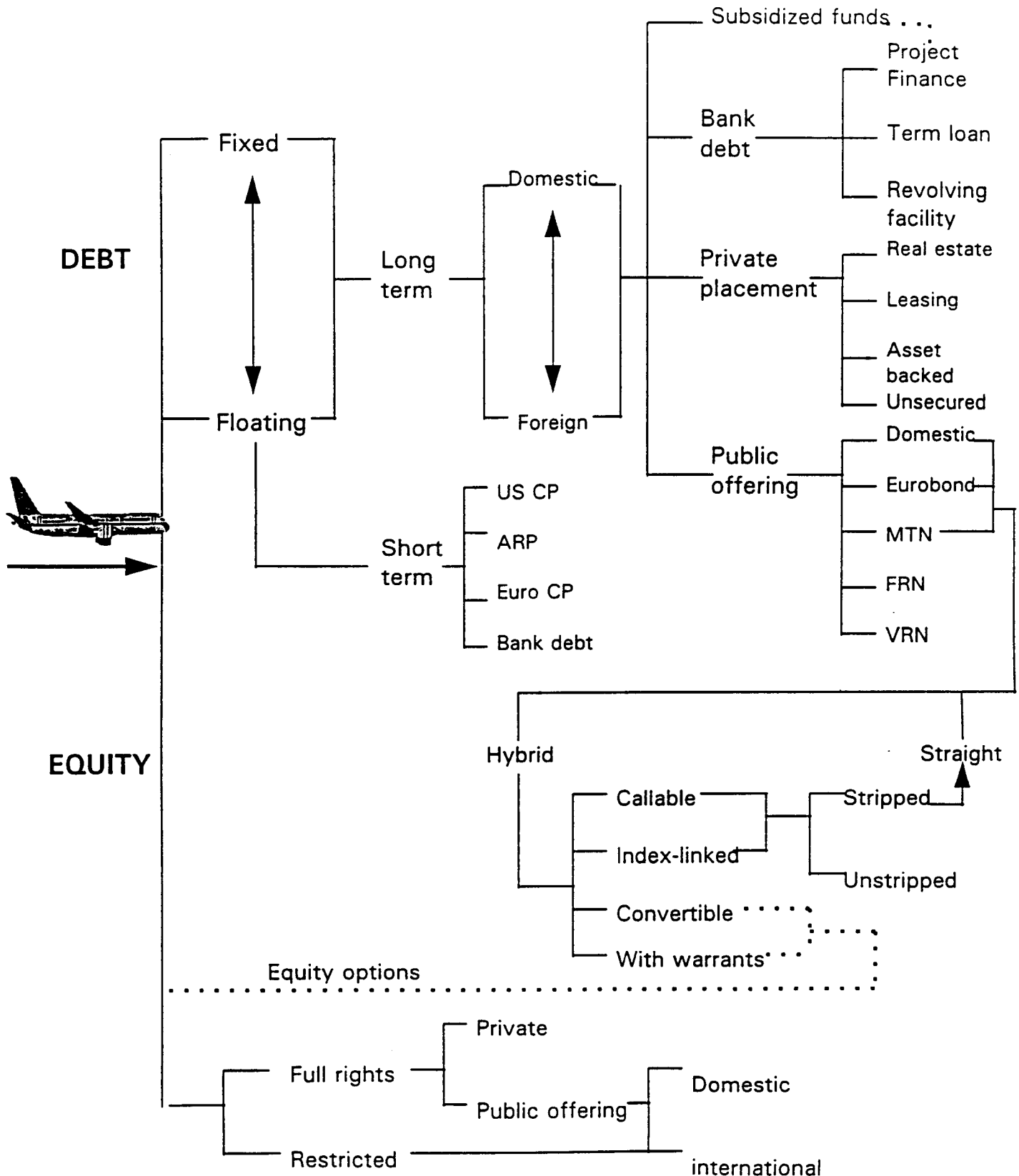


Exhibit 2 FIRM CONTINUUM

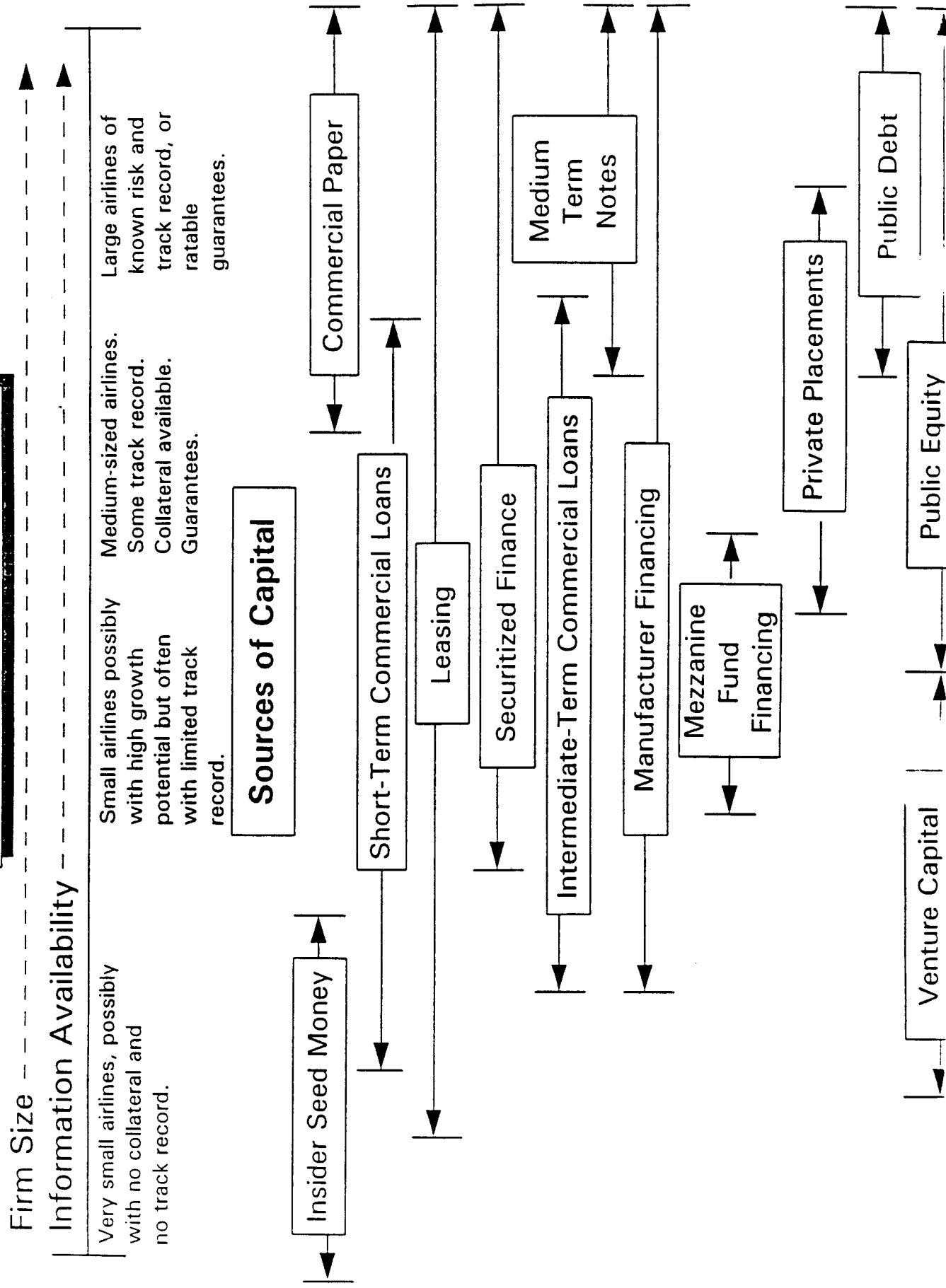


Exhibit 3 Financial Functions and Structures

FUNCTIONS

Product Design
Underwriting
Trade Execution / Brokerage
Market-Making
Packaging / Integration
Risk Management
Arbitrage
Information / Research
Proprietary Activities
Advice

Customer Gateways

Financial
sourcing
requirements

Customer Gateways

Portfolio
optimization
requirements

End-suppliers
of
funds

End-users
of
funds

STRUCTURAL FORMS:

Commercial banks
Full-service investment banks
Boutiques
Finance companies
Insurance companies
Fund managers
Universals
Captives

Issues:
Structure
Duration
Rate
Availability
Transactions cost

Issues:
Risk
Return
Liquidity
Security
Transparency
Transactions cost

Exhibit 4

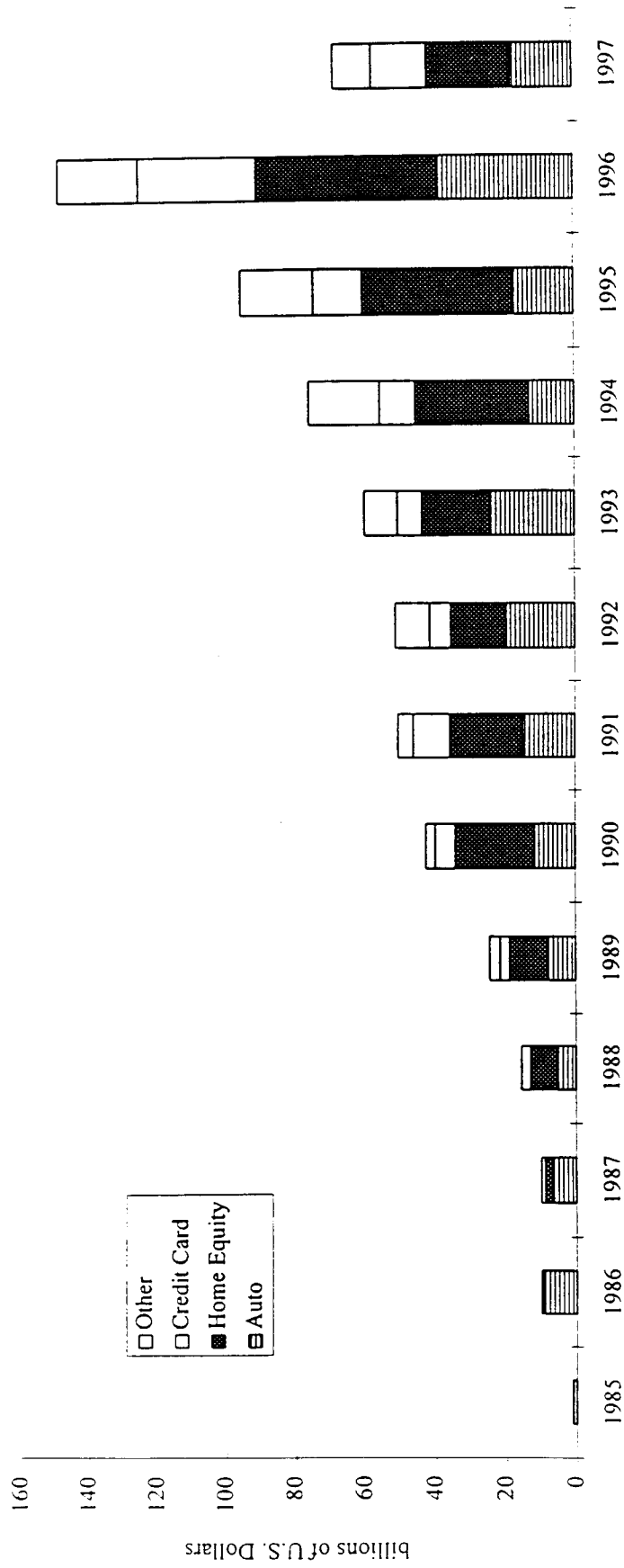
MBS/ABS Chronology by Collateral Type, 1970-1995 (\$ billions)

Cumulative Principal Amount		
Collateral Type	Date of First Issue	Amount
Residential mortgages	Apr-70	\$1,714
Computer leases	Mar-85	3
Retail automobile loans	May-85	121
Affiliate notes	Jul-86	1
Light-truck loans	Jul-86	0
Credit-card receivables	Jan-87	153
Standard-truck loans	Jun-87	2
Trade receivables	Sep-87	1
Automobile leases	Oct-87	2
Consumer loans	Nov-87	2
Boat loans	Sep-88	1
Mobile-home loans	Sep-88	16
Equipment leases	Oct-88	3
Recreational-vehicle loans	Dec-88	2
Home-equity loans	Jan-89	48
Timeshare receivables	Aug-89	0
Wholesale-dealer vehicle loans	Aug-90	12
Wholesale-dealer truck loans	Dec-90	1
Small-business loans	Jan-92	1
Railroad-car leases	May-92	1
Prefabricated-home loans	Jun-92	0
Agricultural-equipment loans	Sep-92	5
Student loans	Jun-93	4
Wholesale-dealer vehicle and equipment loans	Jan-94	2
ABS	Mar-94	1
Tax	Jun-94	0
Home-improvement loans	Jun-94	1
Airplane leases	Aug-94	1
Insurance	Dec-94	0
Utility	Jun-95	1
Total		\$2,099

Source: CS First Boston

Exhibit 5

ABS Annual Issuance by Collateral Type and Principal Amount, 1985-1997



Note: Public transactions only.
Source: 1985-95 data - CS First Boston; 1996 and 1997 Y-T-D data - Moody's

Exhibit 6a : Savings over 12 years vs difference between lending rate and LIBOR + 40 bp¹

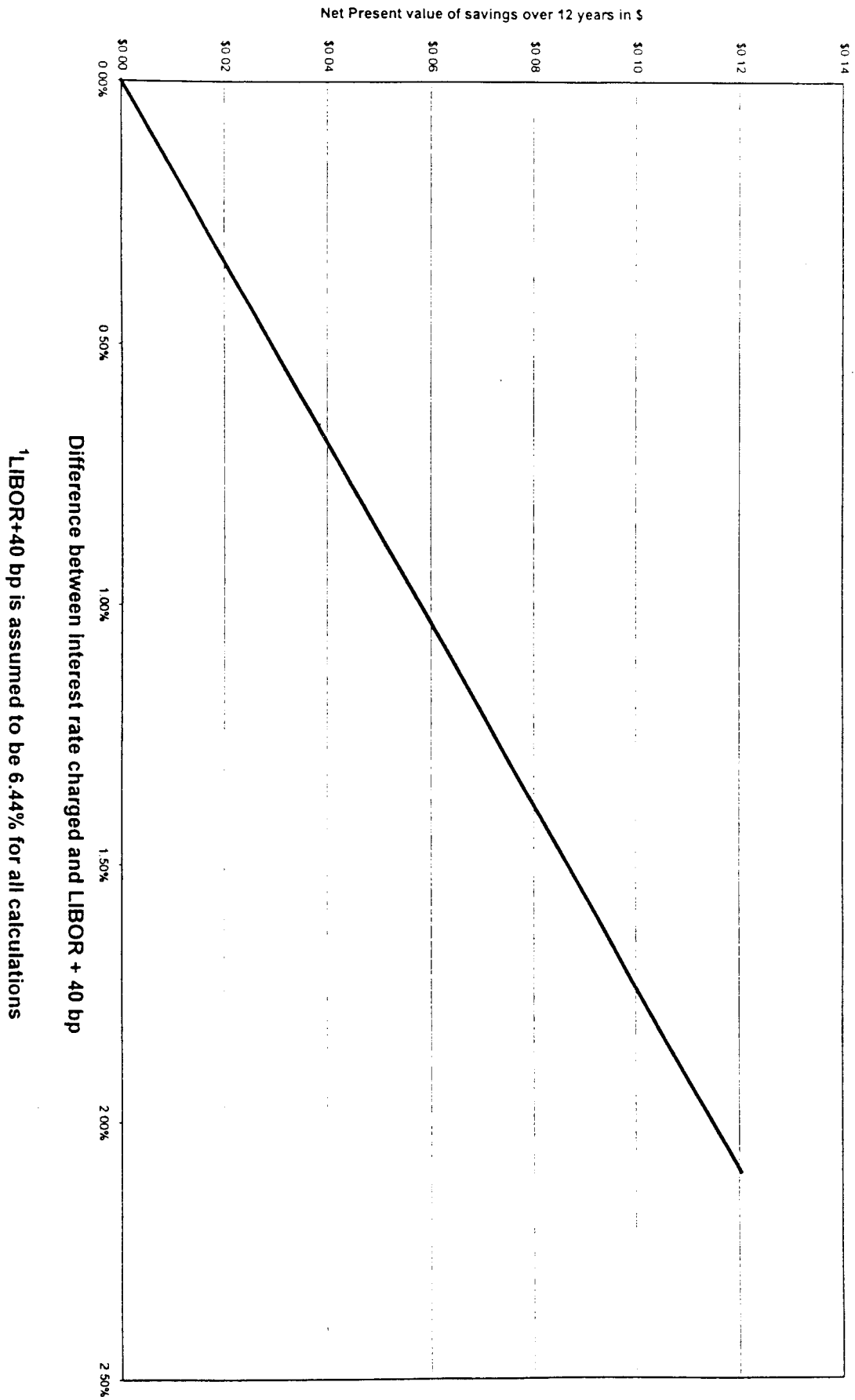
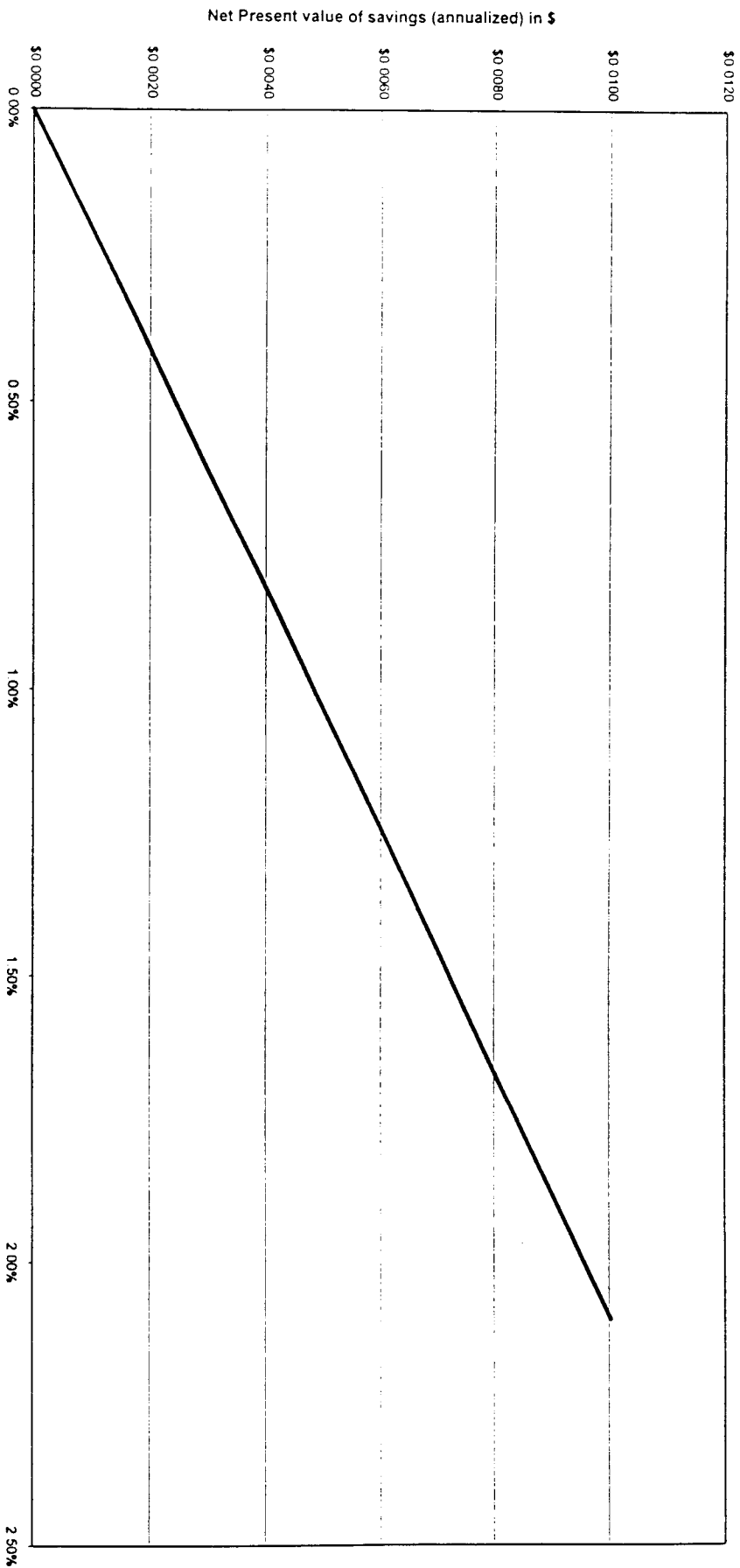


Exhibit 6b : Annualized Savings vs difference between lending rate and LIBOR + 40 bp¹



Difference between interest rate charged and LIBOR + 40 bp

¹ LIBOR+40 BP is assumed to be 6.44%

Table 3 (continued)

	Projected spending in \$ million	Projected savings in \$ million for 1997-2016 ^{9,10}									
		Bond Ratings									
	for 1997-2016	AA-AAA ¹	A-AA ²	BBB-A ³	BB-BBB ⁴	B-BB ⁵	CCC-B ⁶	BBB-AAA ⁷	CCC-BBB ⁸		
Thailand	\$18,737.70	\$430.87	\$641.48	\$641.61	\$1,412.77	\$1,386.80	\$2,933.19	\$1,713.58	\$5,716.87		
Tunisia	\$1,155.20	\$26.56	\$39.55	\$39.56	\$87.10	\$85.50	\$180.83	\$105.64	\$352.45		
Turkey	\$12,949.10	\$297.76	\$443.31	\$443.40	\$976.33	\$958.38	\$2,027.05	\$1,184.21	\$3,950.77		
United Kingdom	\$56,093.80	\$1,289.88	\$1,920.37	\$1,920.74	\$4,229.33	\$4,151.57	\$8,780.91	\$5,129.83	\$17,114.21		
USA	\$293,424.70	\$6,747.30	\$10,045.38	\$10,047.32	\$22,123.45	\$21,716.69	\$45,932.62	\$26,833.94	\$89,523.84		
Vietnam	\$2,898.40	\$66.65	\$99.23	\$99.25	\$218.53	\$214.51	\$453.71	\$265.06	\$884.30		
Yemen	\$781.10	\$17.96	\$26.74	\$26.75	\$58.89	\$57.81	\$122.27	\$71.43	\$238.31		

¹ Savings per \$ of bond (AA-AAA) = \$ 0.023² Savings per \$ of bond (A-AA) = \$ 0.034³ Savings per \$ of bond (BBB-A) = \$ 0.034⁴ Savings per \$ of bond (BB-BBB) = \$ 0.075⁵ Savings per \$ of bond (B-BB) = \$ 0.074⁶ Savings per \$ of bond (CCC-B) = \$ 0.156⁷ Savings per \$ of bond (BBB-AAA) = \$ 0.091⁸ Savings per \$ of bond (CCC-BBB) = \$ 0.305

Potential Savings = Actual Expenditure * Savings per \$ of loan (or bond)

⁹ **Italicized bold face** font denotes \$ savings to given country if it moves up one level on the sovereign credit rating scale. The current rating for a given country is taken as the 1996 S&P sovereign debt standard for long term foreign currency loans. No column is highlighted if either of the following is true:

1. The country has current rating of AAA.

2. A sovereign debt rating is not available.

¹⁰ Projected savings based on delivery \$ under contract with all jet manufacturers in 1997-2016.

Table 4. Capital Flows and reserves in Asia and Latin America

(In billions of U.S. dollars, at annual rates)

	1980-90	1991	1992	1993	1994	1995	1996
Net private capital inflows							
Total	12.9	52.5	81.3	99.1	78.7	77.7	149.8
China	1.9 ¹	-1.9	11.7	7.8	14.6	13.9	23.0
Other Asia ²	4.7	26.2	19.3	34.0	26.8	37.6	56.8
Brazil	3.8	2.5	9.1	9.9	9.1	31.8	35.4
Mexico	1.6	20.6	23.6	30.3	10.3	-13.2	13.5
Other Latin America	0.8	5.0	17.6	17.0	18.0	7.6	21.1
Net official capital inflows							
Total	13.8	12.8	19.8	13.2	13.8	33.8	0.9
China	1.2	2.9	5.4	5.6	9.3	6.9	7.0
Other Asia ²	6.8	8.3	13.3	5.7	3.7	1.9	3.8
Brazil	1.0	-1.4	-0.5	-1.2	-0.7	-0.7	-1.8
Mexico	2.1	2.4	2.0	0.9	0.3	24.5	-10.0
Other Latin America	2.7	0.6	-0.4	3.9	1.2	1.1	1.8
Net increase in reserves							
Total	13.3	55.5	71.4	59.2	48.5	62.6	83.2
China	2.7	14.1	23.2	1.8	30.5	22.5	31.4
Other Asia ²	10.5	25.2	25.7	37.1	23.8	16.2	25.8
Brazil	-0.1	-0.4	14.7	8.7	7.2	12.9	9.3
Mexico	0.6	8.2	1.2	6.1	-18.9	10.7	1.8
Other Latin America	-0.4	8.4	6.6	5.5	5.9	0.4	14.9

Note: Capital flows are calculated as the difference between the current account and the change in reserves; private flows are calculated as a residual from an estimate of official flows.

¹1982-90 ²India, Indonesia, Korea, Malaysia, the Philippines, Singapore, Taiwan and Thailand.

³Argentina, Chile, Colombia, Peru and Venezuela

Sources: IMF Balance of Payments Statistics and Institute of International Finance.

Table 5: Percent of Aircraft Financing to External Debt (EDT)¹

<i>Column A</i>	<i>Column B</i>	<i>Column C</i>	<i>Column B + C</i>
Country	Airline borrowings by country 1995-97 USD Million	Country External Debt 1995 ² USD Million	Aircraft Finance as % of of Total External Debt
Australia	835.12	-	n/a
Austria	252.00	-	n/a
Belgium	17.00	-	n/a
Canada	1,290.24	-	n/a
China	4,477.54	118,090.00	3.79%
Ireland	224.00	-	n/a
Egypt	780.00	34,116.00	2.29%
France	218.18	-	n/a
Germany	80.00	-	n/a
Hong Kong	1,143.49	-	n/a
India	945.77	93,766.00	1.01%
Indonesia	895.00	107,831.00	0.83%
Italy	250.00	-	n/a
Japan	582.00	-	n/a
South Korea	3,649.65	-	n/a
Kuwait	440.00	-	n/a
Lithuania	17.86	-	n/a
Malaysia	1,094.30	34,352.00	3.19%
Mexico	32.00	165,743.00	0.02%
Morocco	76.85	22,147.00	0.35%
Netherlands	751.55	-	n/a
New Zealand	373.00	-	n/a
Philippines	313.50	39,445.00	0.79%
Poland	416.01	42,291.00	0.98%
Portugal	220.00	-	n/a
Russia	21.00	120,461.00	0.02%
Saudi Arabia	180.00	-	n/a
Singapore	122.00	-	n/a
South Africa	175.00	-	n/a
Spain	578.00	-	n/a
Sri Lanka	94.00	8,230.00	1.14%
Sweden	810.55	-	n/a
Switzerland	159.00	-	n/a
Thailand	337.70	56,789.00	0.59%
United Arab Emirate	1,311.00	-	n/a
United Kingdom	3,925.95	-	n/a
United States	3,439.15	-	n/a
Vietnam	53.00	26,495.00	0.20%

Notes:¹ EDT = Total External Debt. Figures include short-term debt and use of IMF credit.² Source: Global Development Finance 1997 (formerly World Debt Tables)

Volume 2: Country Tables, 1995 data

Table 6. External Debt and Country Risk Ratings

Summary Results:

Correlation between Amount Borrowed by each Country (1995-97) divided by GDP and:

Ia. Institutional Investor Rating: (0.40)

Ib. ING Model Sovereign Risk Rating: (0.39)

Ic. ICRG Risk Rating: (0.27)

Id. Euromoney Rating: (0.35)

Column A	Column B	Column C	D = Column B-C	Column E	Column F	Column G	Column H
Country	Amount Borrowed ^b Country ¹ USD Million	GDP of Country ¹ USD Million	Weight of Borrowing	Institutional Investor 1996 Credit Rating	ING Model Sovereign Risk Rating 1996	ICRG Rating Dec. 1996	Euromoney Survey Rating Sept. 1996 ³
Australia	835.12	348,782	0.24%	71.00	14.95	85.50	91.40
Austria	252.00	233,427	0.11%	85.70	17.10	89.50	95.20
Belgium	17.00	269,081	0.01%	79.50	17.26	87.50	93.40
Canada	1,290.24	568,928	0.23%	79.90	15.64	85.00	91.80
China	4,477.54	697,647	0.64%	56.40	9.97	74.50	71.30
Ireland	224.00	60,780	0.37%	74.40	17.66	88.50	92.30
Egypt	780.00	47,349	1.65%	34.00	-	67.50	45.70
France	218.18	1,536,089	0.01%	88.40	17.81	82.50	95.70
Germany	80.00	2,415,764	0.00%	91.50	17.63	85.00	95.70
Hong Kong	1,143.49	143,669	0.80%	65.40	13.47	85.00	82.40
India	945.77	324,082	0.29%	45.80	7.63	69.00	63.70
Indonesia	895.00	198,079	0.45%	51.80	9.07	70.00	70.80
Italy	250.00	1,086,932	0.02%	72.00	14.29	82.50	87.80
Japan	582.00	5,108,540	0.01%	91.00	18.09	89.50	94.00
South Korea	3,649.65	455,476	0.80%	72.00	13.98	85.00	84.30
Kuwait	440.00	26,650	1.65%	54.10	-	80.50	74.80
Lithuania	17.86	7,089	0.25%	23.80	-	-	55.20
Malaysia	1,094.30	85,311	1.28%	68.40	13.78	81.50	80.20
Mexico	32.00	250,038	0.01%	41.20	7.33	70.00	60.30
Morocco	76.85	32,412	0.24%	38.70	-	71.50	-
Netherlands	751.55	395,900	0.19%	89.20	17.75	89.50	97.90
New Zealand	373.00	57,070	0.65%	70.30	16.02	85.00	92.00
Philippines	313.50	74,180	0.42%	38.10	8.41	71.50	61.50
Poland	416.01	117,663	0.35%	40.20	7.48	80.00	57.10
Portugal	220.00	102,337	0.21%	68.80	15.39	85.50	80.20
Russia	21.00	344,711	0.01%	19.90	-	62.50	42.60
Saudi Arabia	180.00	125,501	0.14%	55.10	-	73.00	72.60
Singapore	122.00	83,695	0.15%	82.80	18.36	91.00	95.70
South Africa	175.00	136,035	0.13%	46.30	8.80	72.50	62.30
Spain	578.00	558,617	0.10%	73.20	14.39	80.50	83.70
Sri Lanka	94.00	12,915	0.73%	32.50	-	62.50	43.00
Sweden	810.55	228,679	0.35%	74.30	15.31	84.00	90.00
Switzerland	159.00	300,508	0.05%	91.50	17.23	89.50	98.80
Thailand	337.70	167,056	0.20%	63.40	13.64	81.00	77.20
United Arab Emirates	1,311.00	39,107	3.35%	60.80	-	76.00	75.80
United Kingdom	3,925.95	1,105,822	0.36%	88.20	17.26	83.00	96.10
United States	3,439.15	6,952,020	0.05%	90.90	16.56	86.00	98.40
Vietnam	53.00	20,351	0.26%	30.30	-	70.50	52.00
	30,581.40						

NOTES:¹ Sum of borrowings of individual airlines of a country 1995-97. Source - Capital Data² World Development Report 1997 1995 GDP in USD Million³ Euromoney Country Ratings as of September 1996 was used, other ratings data are December 1996 numbers

Exhibit 7

Interest Savings per \$ of Bond Financing Amount

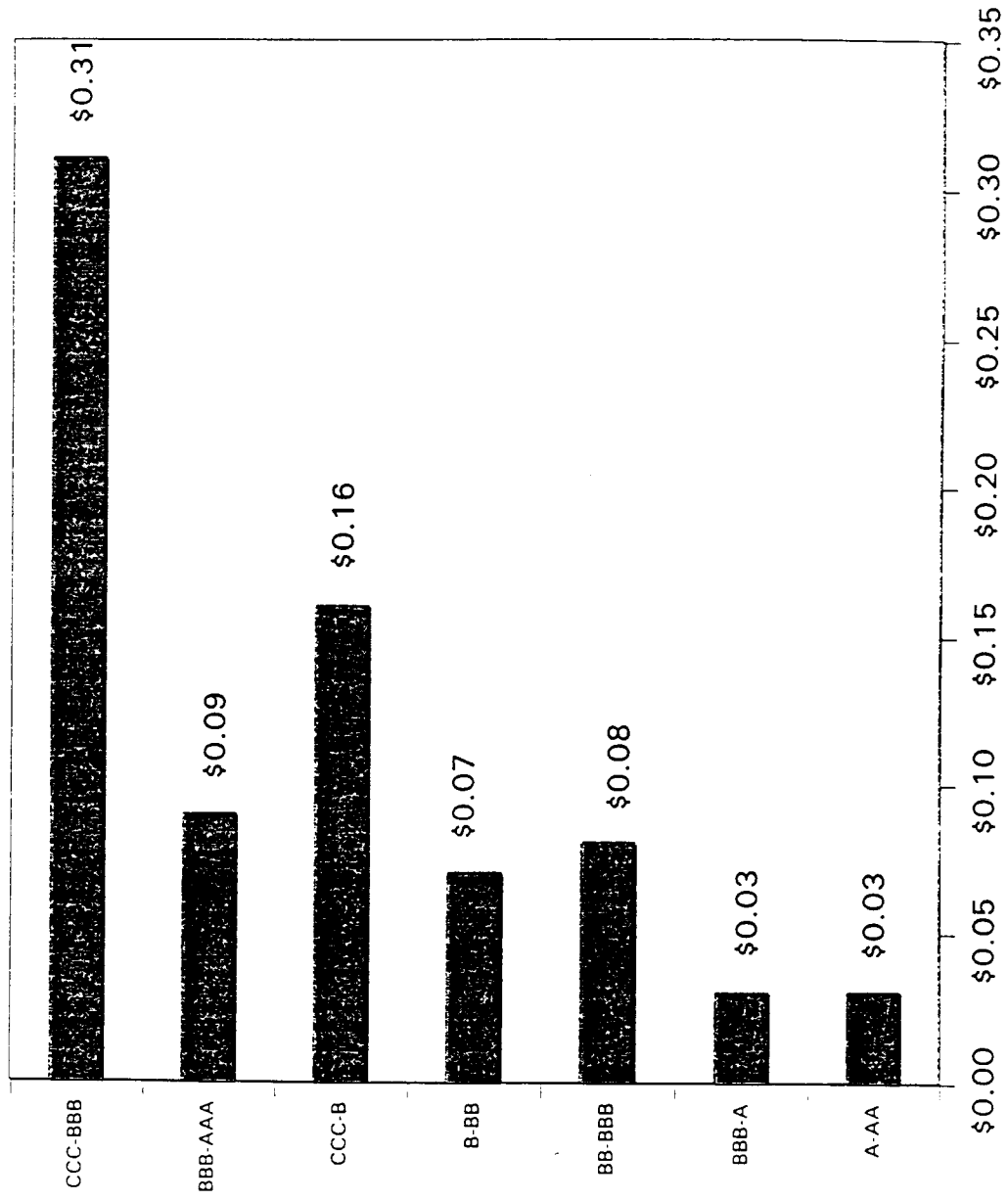
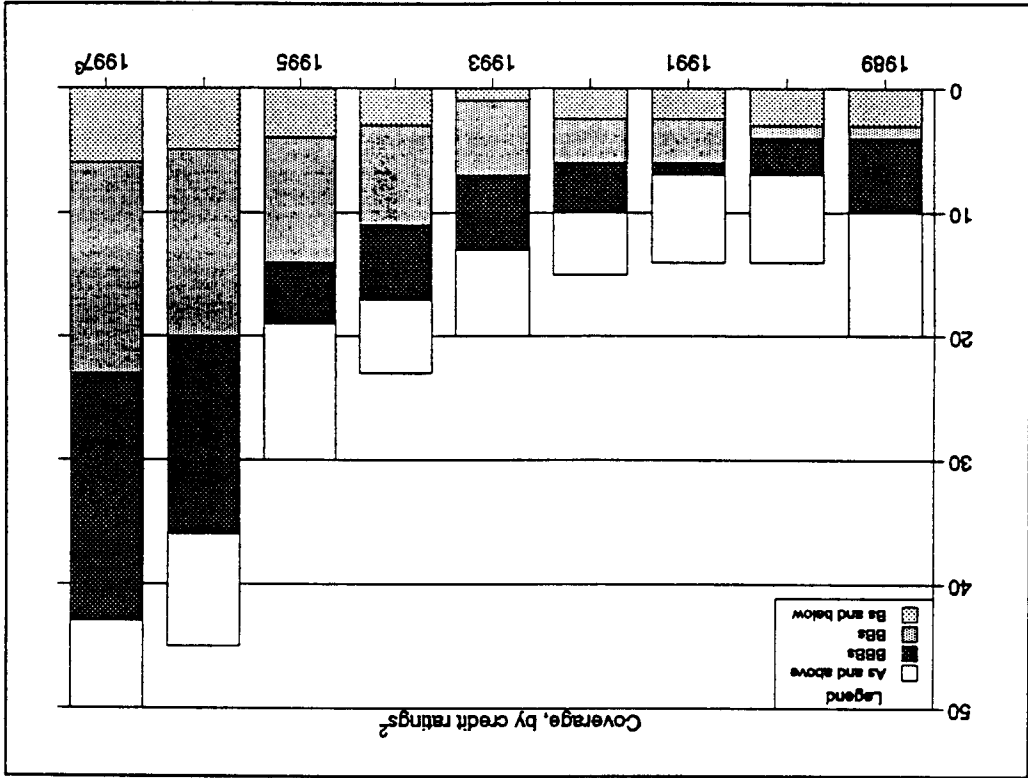
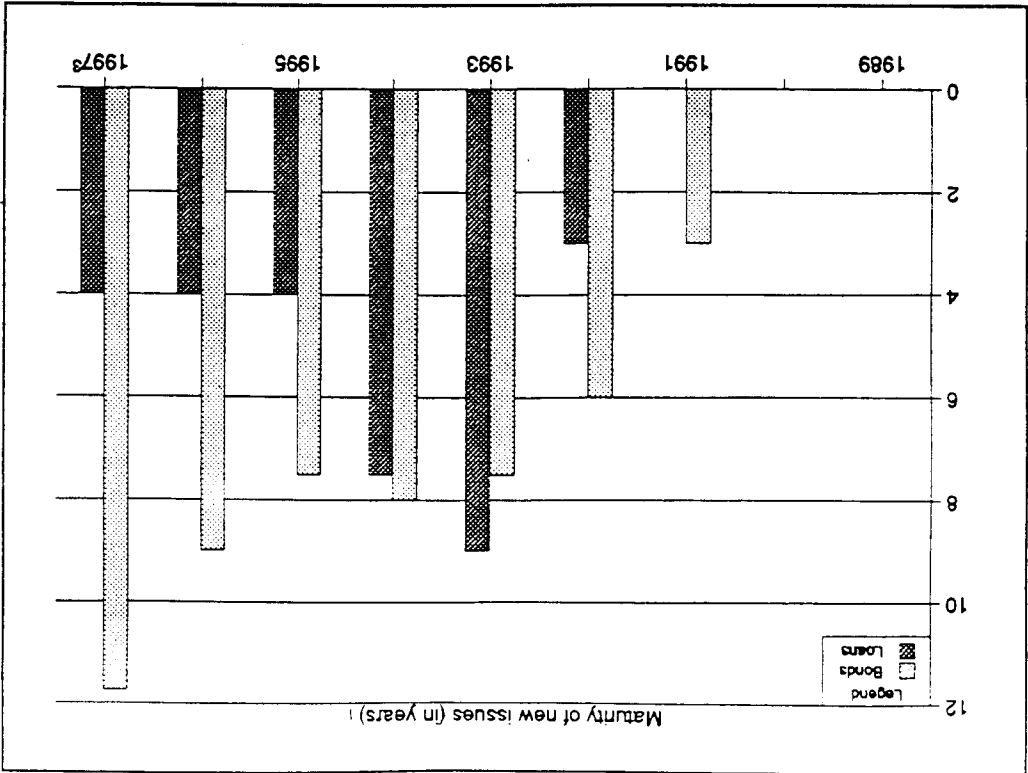


Exhibit 8: Emerging markets: maturities and ratings



¹ Based on selected new issues for which data on credit ratings and spreads exist. ² Number of countries with sovereign credit ratings assigned by Moody's or Standard & Poor's. ³ End-March.

Sources: Moody's, Standard & Poor's and Euromoney Bondware and Loanware.

Exhibit 9 : Savings (in \$ billion) vs difference in lending rate and LIBOR+40bp, based on actual expenditures between 1992-1997(Feb)

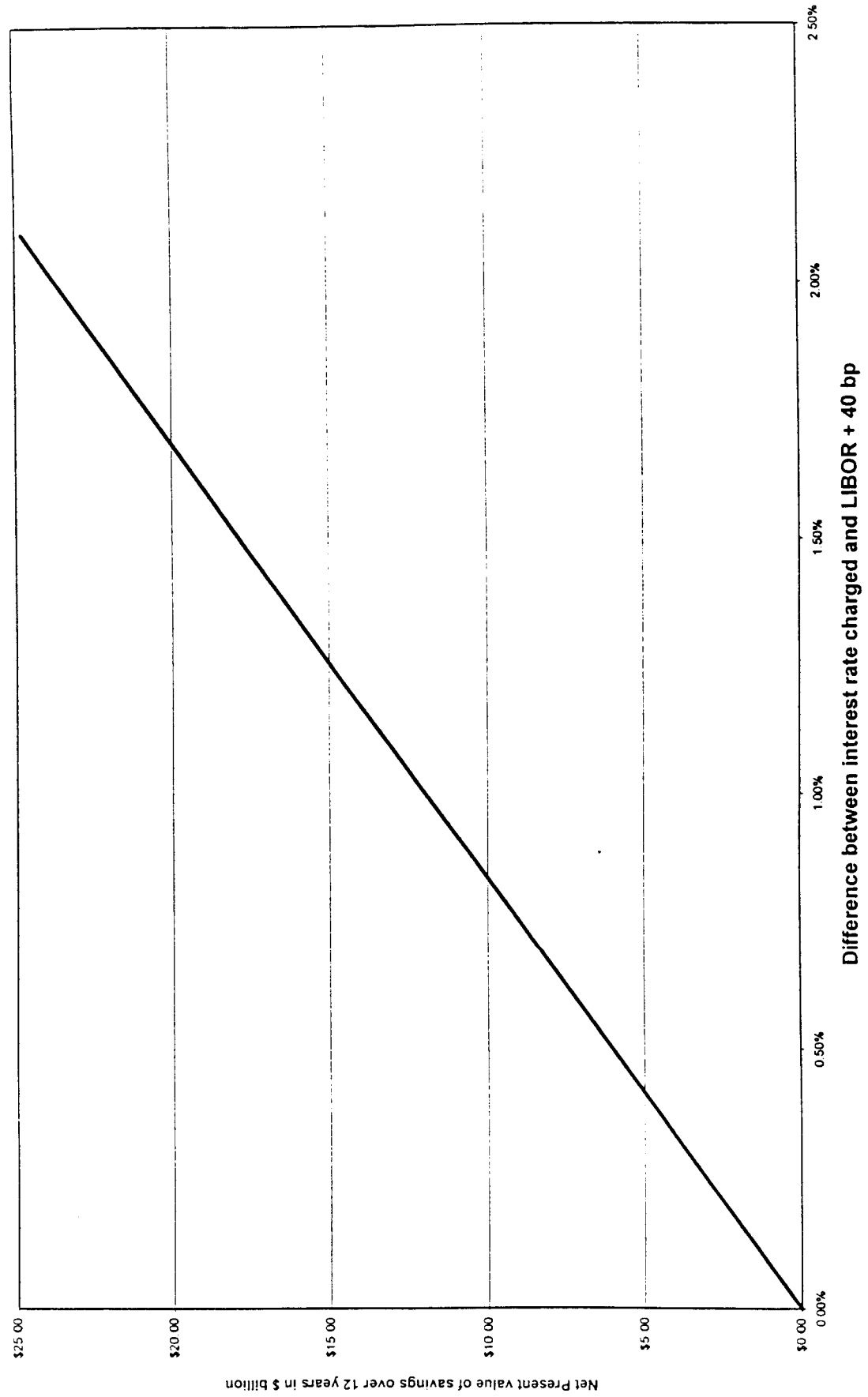


Exhibit 10 : Savings (in \$ billion) vs difference in lending rate and LIBOR+40bp, based on projected expenditures between 1997-2016(Feb)

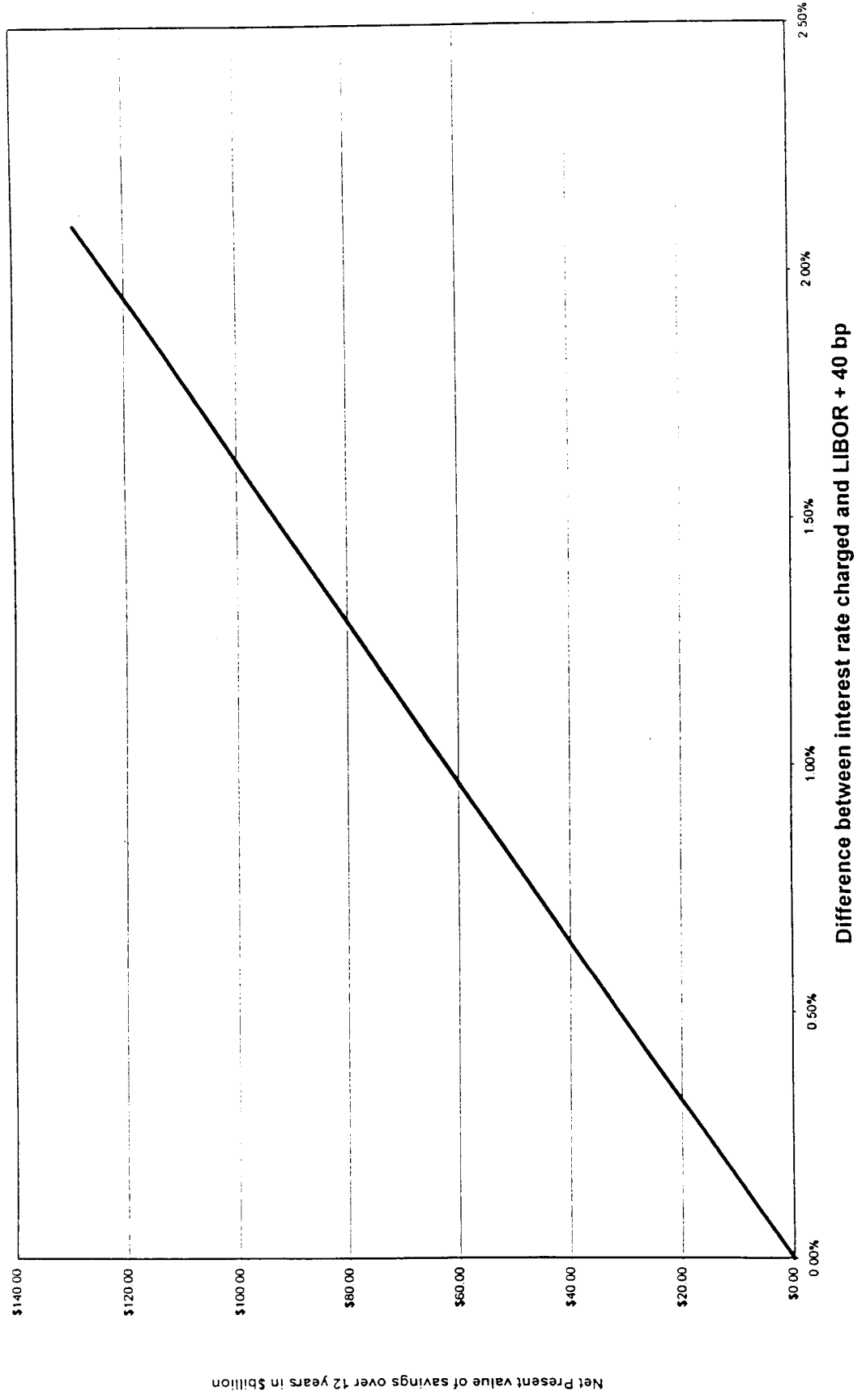


Exhibit 11
Airline Privatizations in the 1990's
Sale Price in US \$million

Airline	Country	Year	Sale Price	Private	Major Buyer
Singapore Airlines	Singapore	1985	345	46%	Public Offering
Japan Airlines	Japan	1987	4690	100%	Public Offering
British Airways	United Kingdom	1987			
Air Canada	Canada	1988	575	100%	Public Offering
Air New Zealand	New Zealand	1989	392	100%	International Consortium
Aerolineas Argentinas	Argentina	1990	260	85%	Iberia (Spain)
Viasa	Venezuela	1991	145	40%	Iberia (Spain) and Banco Provincial (Venezuela)
MALEV	Hungary	1992	77	30%	Alitalia (Italy)
Philippine Airlines	Philippines	1992	419	53%	PR Holdings
Qantas Airways	Australia	1993	1530	100%	25% stake sold to British Airways in 1993 and 75% stake sol through IPO in July 1995
Carib Express	Barbados	1994		90%	
Air Jamaica	Jamaica	1994	27	70%	Hotel Chain Sandals
BWIA	Trinidad & Tobago	1994	20	51%	Local Investors (7 million) U.S. Investors (13 million; AIG put up 5.5 10% already trading through SET (Stock Exchange of Thailand)
Thai Airways International	Thailand	1995			
Ecuadoriana	Ecuador	1996			
Lloyd Aereo Boliviano	Bolivia	1996			
Sun Air	South Africa	1997			
Kenya Airways	Kenya	1997	70	77%	KLM (26%), Kenya investors (institutional - 12% and individual - 22%), and international investors (14%)
AeroMexico	Mexico	-			

Other Expected Airline Privatizations
Pakistan International Airline, Pakistan (1996)
LOT, Polish Airline (1996)
Latavio, Latvian national airline (announced 1995)
El Al, Isareli Airline was decided to be privatized by the Isareli Cabinet (1994)
Estonian Air, Estonia (announced 1995)
Liat, Antigua (1995)

Example of Methodology : Interest Cost Saving in issuing AA versus AA bond

Average AAA bond yields between 1992-1995(Feb) = 7.59%
 Average AA bond yields between 1992-1995(Feb) = 7.89%
 Discount rate used to calculate NPV = 7.74%
 (average of AAA and AA bond yields)

Net Present Value of Interest Savings per Dollar of loan is

Table 2

Hypothetical savings in \$ million for 1992-1997^a

	\$ million spent in 1992-1997	Bond Ratings							
		AA-AAA ¹	A-AA ²	BBB-A ³	BB-BBB ⁴	B-BB ⁵	CCC-B ⁶	BBB-AAA ⁷	CCC-BBB ⁸
Argentina	\$328.00	\$7.54	\$11.23	\$11.23	\$24.73	\$24.28	\$51.35	\$30.00	\$100.07
Australia	\$6,089.00	\$140.02	\$208.46	\$208.50	\$459.09	\$450.65	\$953.17	\$556.84	\$1,857.75
Austria	\$1,429.00	\$32.86	\$48.92	\$48.93	\$107.74	\$105.76	\$223.70	\$130.68	\$435.99
Bahrain	\$2,205.00	\$50.70	\$75.49	\$75.50	\$166.25	\$163.19	\$345.17	\$201.65	\$672.75
Bangladesh	\$166.00	\$3.82	\$5.68	\$5.68	\$12.52	\$12.29	\$25.99	\$15.18	\$50.65
Belgium	\$1,367.00	\$31.43	\$46.80	\$46.81	\$103.07	\$101.17	\$213.99	\$125.01	\$417.07
Bermuda	\$77.00	\$1.77	\$2.64	\$2.64	\$5.81	\$5.70	\$12.05	\$7.04	\$23.49
Bhutan	\$24.00	\$0.55	\$0.82	\$0.82	\$1.81	\$1.78	\$3.76	\$2.19	\$7.32
Brazil	\$1,468.00	\$33.76	\$50.26	\$50.27	\$110.68	\$108.65	\$229.80	\$134.25	\$447.89
Brunei	\$296.00	\$6.81	\$10.13	\$10.14	\$22.32	\$21.91	\$46.34	\$27.07	\$90.31
Canada	\$3,542.00	\$81.45	\$121.26	\$121.28	\$267.06	\$262.15	\$554.46	\$323.92	\$1,080.66
China	\$9,219.00	\$211.99	\$315.61	\$315.67	\$695.09	\$682.31	\$1,443.14	\$843.09	\$2,812.72
Columbia	\$284.00	\$6.53	\$9.72	\$9.72	\$21.41	\$21.02	\$44.46	\$25.97	\$86.65
Cyprus	\$181.00	\$4.16	\$6.20	\$6.20	\$13.65	\$13.40	\$28.33	\$16.55	\$55.22
Czechoslovakia	\$233.00	\$5.36	\$7.98	\$7.98	\$17.57	\$17.24	\$36.47	\$21.31	\$71.09
Denmark	\$628.00	\$14.44	\$21.50	\$21.50	\$47.35	\$46.48	\$98.31	\$57.43	\$191.60
Dubai	\$1,214.00	\$27.92	\$41.56	\$41.57	\$91.53	\$89.85	\$190.04	\$111.02	\$370.39
Egypt	\$989.00	\$22.74	\$33.86	\$33.86	\$74.57	\$73.20	\$154.82	\$90.44	\$301.74
El Salvador	\$95.00	\$2.18	\$3.25	\$3.25	\$7.16	\$7.03	\$14.87	\$8.69	\$28.98
Ethiopia	\$117.00	\$2.69	\$4.01	\$4.01	\$8.82	\$8.66	\$18.32	\$10.70	\$35.70
Finland	\$261.00	\$6.00	\$8.94	\$8.94	\$19.68	\$19.32	\$40.86	\$23.87	\$79.63
France	\$5,292.00	\$121.69	\$181.17	\$181.21	\$399.00	\$391.67	\$828.41	\$483.96	\$1,614.59
Germany	\$10,206.00	\$234.69	\$349.40	\$349.47	\$769.51	\$755.36	\$1,597.64	\$933.35	\$3,113.85
Greece	\$213.00	\$4.90	\$7.29	\$7.29	\$16.06	\$15.76	\$33.34	\$19.48	\$64.99
Hong Kong	\$4,245.00	\$97.61	\$145.33	\$145.36	\$320.06	\$314.18	\$664.51	\$388.21	\$1,295.15
Hungary	\$170.00	\$3.91	\$5.82	\$5.82	\$12.82	\$12.58	\$26.61	\$15.55	\$51.87
India	\$1,491.00	\$34.29	\$51.04	\$51.05	\$112.42	\$110.35	\$233.40	\$136.35	\$454.90
Indonesia	\$2,345.00	\$53.92	\$80.28	\$80.30	\$176.81	\$173.56	\$367.09	\$214.45	\$715.46
Iran	\$192.00	\$4.42	\$6.57	\$6.57	\$14.48	\$14.21	\$30.06	\$17.56	\$58.58
Ireland	\$4,171.00	\$95.91	\$142.79	\$142.82	\$314.48	\$308.70	\$652.93	\$381.44	\$1,272.57

Table 2 (continued)

Hypothetical savings in \$ million for 1992-1997⁹

	\$ million spent	Bond Ratings							
	in 1992-1997	AA-AAA ¹	A-AA ²	BBB-A ³	BB-BBB ⁴	B-BB ⁵	CCC-B ⁶	BBB-AAA ⁷	CCC-BBB ⁸
Sri Lanka	\$486.00	\$11.18	\$16.64	\$16.64	\$36.64	\$35.97	\$76.08	\$44.45	\$148.28
Sudan	\$48.00	\$1.10	\$1.64	\$1.64	\$3.62	\$3.55	\$7.51	\$4.39	\$14.64
Swaziland	\$30.00	\$0.69	\$1.03	\$1.03	\$2.26	\$2.22	\$4.70	\$2.74	\$9.15
Sweden	\$1,072.00	\$24.65	\$36.70	\$36.71	\$80.83	\$79.34	\$167.81	\$98.04	\$327.07
Switzerland	\$2,502.00	\$57.53	\$85.66	\$85.67	\$188.64	\$185.18	\$391.66	\$228.81	\$763.36
Taiwan	\$5,461.00	\$125.58	\$186.96	\$186.99	\$411.75	\$404.17	\$854.86	\$499.41	\$1,666.15
Thailand	\$3,248.00	\$74.69	\$111.20	\$111.22	\$244.89	\$240.39	\$508.44	\$297.03	\$990.96
Tunisia	\$451.00	\$10.37	\$15.44	\$15.44	\$34.00	\$33.38	\$70.60	\$41.24	\$137.60
Turkey	\$1,249.00	\$28.72	\$42.76	\$42.77	\$94.17	\$92.44	\$195.52	\$114.22	\$381.07
Turkmenistan	\$153.00	\$3.52	\$5.24	\$5.24	\$11.54	\$11.32	\$23.95	\$13.99	\$46.68
Ukraine	\$391.00	\$8.99	\$13.39	\$13.39	\$29.48	\$28.94	\$61.21	\$35.76	\$119.29
Unidentified	\$372.00	\$8.55	\$12.74	\$12.74	\$28.05	\$27.53	\$58.23	\$34.02	\$113.50
United Kingdom	\$9,820.00	\$225.81	\$336.19	\$336.25	\$740.40	\$726.79	\$1,537.22	\$898.05	\$2,996.08
USA	\$70,391.00	\$1,618.64	\$2,409.83	\$2,410.30	\$5,307.30	\$5,209.72	\$11,018.99	\$6,437.32	\$21,476.29
Uzbekistan	\$245.00	\$5.63	\$8.39	\$8.39	\$18.47	\$18.13	\$38.35	\$22.41	\$74.75
Vietnam	\$470.00	\$10.81	\$16.09	\$16.09	\$35.44	\$34.79	\$73.57	\$42.98	\$143.40
Yemen	\$164.00	\$3.77	\$5.61	\$5.62	\$12.37	\$12.14	\$25.67	\$15.00	\$50.04

¹ Savings per \$ of bond (AA-AAA) = \$ 0.023² Savings per \$ of bond (A-AA) = \$ 0.034³ Savings per \$ of bond (BBB-A) = \$ 0.034⁴ Savings per \$ of bond (BB-BBB) = \$ 0.075⁵ Savings per \$ of bond (B-BB) = \$ 0.074⁶ Savings per \$ of bond (CCC-B) = \$ 0.156⁷ Savings per \$ of bond (BBB-AAA) = \$ 0.091⁸ Savings per \$ of bond (CCC-BBB) = \$ 0.305

Potential Savings = Actual Expenditure * Savings per \$ of loan (or bond)

⁹ *Italicized bold face* font denotes \$ savings to given country if it moves up one level on the sovereign credit rating scale. The current rating for a given country is taken as the 1996 S&P sovereign debt standard for long term foreign currency loans. No column is highlighted if either of the following is true:

1. The country has current rating of AAA.

2. A sovereign debt rating is not available.

Table 2 (continued)

Hypothetical savings in \$ million for 1992-1997⁹

	\$ million spent in 1992-1997	Bond Ratings									
		AA-AAA ¹	A-AA ²	BBB-A ³	BB-BBB ⁴	B-BB ⁵	CCC-B ⁶	BBB-AAA ⁷	CCC-BBB ⁸		
Italy	\$3,182.00	\$73.17	\$108.94	\$108.96	\$239.91	\$235.50	\$498.11	\$291.00	\$970.83		
Ivory Coast	\$258.00	\$5.93	\$8.83	\$8.83	\$19.45	\$19.09	\$40.39	\$23.59	\$78.72		
Jamaica	\$102.00	\$2.35	\$3.49	\$3.49	\$7.69	\$7.55	\$15.97	\$9.33	\$31.12		
Japan	\$15,012.00	\$345.20	\$513.94	\$514.03	\$1,131.87	\$1,111.06	\$2,349.97	\$1,372.86	\$4,580.16		
Jordan	\$48.00	\$1.10	\$1.64	\$1.64	\$3.62	\$3.55	\$7.51	\$4.39	\$14.64		
Kenya	\$91.00	\$2.09	\$3.12	\$3.12	\$6.86	\$6.74	\$14.25	\$8.32	\$27.76		
Korea, South	\$7,767.00	\$178.60	\$265.90	\$265.95	\$585.61	\$574.84	\$1,215.84	\$710.30	\$2,369.71		
Kuwait	\$1,512.00	\$34.77	\$51.76	\$51.77	\$114.00	\$111.90	\$236.69	\$138.27	\$461.31		
Luxembourg	\$603.00	\$13.87	\$20.64	\$20.65	\$45.46	\$44.63	\$94.39	\$55.14	\$183.98		
Macedonia	\$89.00	\$2.05	\$3.05	\$3.05	\$6.71	\$6.59	\$13.93	\$8.14	\$27.15		
Malaysia	\$4,943.00	\$113.66	\$169.22	\$169.26	\$372.69	\$365.84	\$773.78	\$452.04	\$1,508.11		
Malta	\$260.00	\$5.98	\$8.90	\$8.90	\$19.60	\$19.24	\$40.70	\$23.78	\$79.33		
Mauritius	\$122.00	\$2.81	\$4.18	\$4.18	\$9.20	\$9.03	\$19.10	\$11.16	\$37.22		
Mexico	\$553.00	\$12.72	\$18.93	\$18.94	\$41.69	\$40.93	\$86.57	\$50.57	\$168.72		
Morocco	\$327.00	\$7.52	\$11.19	\$11.20	\$24.65	\$24.20	\$51.19	\$29.90	\$99.77		
Mozambique	\$78.00	\$1.79	\$2.67	\$2.67	\$5.88	\$5.77	\$12.21	\$7.13	\$23.80		
Nauru	\$84.00	\$1.93	\$2.88	\$2.88	\$6.33	\$6.22	\$13.15	\$7.68	\$25.63		
Netherlands	\$3,799.00	\$87.36	\$130.06	\$130.08	\$286.43	\$281.17	\$594.69	\$347.42	\$1,159.07		
New Zealand	\$539.00	\$12.39	\$18.45	\$18.46	\$40.64	\$39.89	\$84.37	\$49.29	\$164.45		
Norway	\$324.00	\$7.45	\$11.09	\$11.09	\$24.43	\$23.98	\$50.72	\$29.63	\$98.85		
Pakistan	\$250.00	\$5.75	\$8.56	\$8.56	\$18.85	\$18.50	\$39.13	\$22.86	\$76.27		
Peru	\$32.00	\$0.74	\$1.10	\$1.10	\$2.41	\$2.37	\$5.01	\$2.93	\$9.76		
Philippines	\$1,291.00	\$29.69	\$44.20	\$44.21	\$97.34	\$95.55	\$202.09	\$118.06	\$393.88		
Poland	\$632.00	\$14.53	\$21.64	\$21.64	\$47.65	\$46.78	\$98.93	\$57.80	\$192.82		
Portugal	\$491.00	\$11.29	\$16.81	\$16.81	\$37.02	\$36.34	\$76.86	\$44.90	\$149.80		
Qatar	\$112.00	\$2.58	\$3.83	\$3.84	\$8.44	\$8.29	\$17.53	\$10.24	\$34.17		
Romania	\$365.00	\$8.39	\$12.50	\$12.50	\$27.52	\$27.01	\$57.14	\$33.38	\$111.36		
Saudi Arabia	\$394.00	\$9.06	\$13.49	\$13.49	\$29.71	\$29.16	\$61.68	\$36.03	\$120.21		
Singapore	\$7,023.00	\$161.49	\$240.43	\$240.48	\$529.52	\$519.78	\$1,099.38	\$642.26	\$2,142.72		
South Africa	\$442.00	\$10.16	\$15.13	\$15.13	\$33.33	\$32.71	\$69.19	\$40.42	\$134.85		

Table 3

Projected savings in \$ million for 1997-2016^{9,10}

Projected savings in \$ million for 1997-2016 ^{9,10}									
Projected spending in \$ million for 1997-2016	Bond Ratings								CCC-BBB ⁸
	AA-AAA ¹	A-AA ²	BBB-A ³	BB-BBB ⁴	B-BB ⁵	CCC-B ⁶	BBB-AAA ⁷		
Argentina	\$6,137.30	\$141.13	\$210.11	\$210.15	\$462.74	\$454.23	\$960.73	\$561.26	\$1,872.49
Australia	\$24,756.30	\$569.27	\$847.53	\$847.69	\$1,866.56	\$1,832.24	\$3,875.34	\$2,263.99	\$7,553.14
Austria	\$4,080.10	\$93.82	\$139.68	\$139.71	\$307.63	\$301.97	\$638.70	\$373.13	\$1,244.84
Bangladesh	\$2,192.30	\$50.41	\$75.05	\$75.07	\$165.29	\$162.25	\$343.18	\$200.49	\$668.87
Belgium	\$6,028.60	\$138.63	\$206.39	\$206.43	\$454.54	\$446.18	\$943.72	\$551.32	\$1,839.33
Brazil	\$18,800.70	\$432.32	\$643.64	\$643.77	\$1,417.52	\$1,391.46	\$2,943.06	\$1,719.34	\$5,736.09
Brunei	\$3,160.00	\$72.66	\$108.18	\$108.20	\$238.26	\$233.88	\$494.67	\$288.98	\$964.12
Canada	\$22,981.80	\$528.47	\$786.78	\$786.93	\$1,732.77	\$1,700.91	\$3,597.56	\$2,101.71	\$7,011.74
China	\$99,544.00	\$2,289.02	\$3,407.88	\$3,408.54	\$7,505.36	\$7,367.36	\$15,582.59	\$9,103.39	\$30,370.86
Columbia	\$5,225.60	\$120.16	\$178.90	\$178.93	\$394.00	\$386.75	\$818.01	\$477.89	\$1,594.33
Cyprus	\$1,602.10	\$36.84	\$54.85	\$54.86	\$120.79	\$118.57	\$250.79	\$146.51	\$488.80
Czechoslovakia	\$1,440.00	\$33.11	\$49.30	\$49.31	\$108.57	\$106.58	\$225.42	\$131.69	\$439.34
Denmark	\$1,009.90	\$23.22	\$34.57	\$34.58	\$76.14	\$74.74	\$158.09	\$92.36	\$308.12
Egypt	\$4,114.60	\$94.62	\$140.86	\$140.89	\$310.23	\$304.53	\$644.10	\$376.28	\$1,255.36
El Salvador	\$667.10	\$15.34	\$22.84	\$22.84	\$50.30	\$49.37	\$104.43	\$61.01	\$203.53
Ethiopia	\$416.60	\$9.58	\$14.26	\$14.27	\$31.41	\$30.83	\$65.21	\$38.10	\$127.10
Finland	\$2,860.80	\$65.78	\$97.94	\$97.96	\$215.70	\$211.73	\$447.83	\$261.62	\$872.83
France	\$43,746.40	\$1,005.95	\$1,497.66	\$1,497.95	\$3,298.36	\$3,237.72	\$6,848.05	\$4,000.65	\$13,347.02
Germany	\$44,366.80	\$1,020.22	\$1,518.90	\$1,519.19	\$3,345.14	\$3,283.64	\$6,945.17	\$4,057.38	\$13,536.31
Greece	\$2,883.70	\$66.31	\$98.72	\$98.74	\$217.42	\$213.43	\$451.41	\$263.72	\$879.82
Hong Kong	\$24,083.70	\$553.80	\$824.50	\$824.66	\$1,815.85	\$1,782.46	\$3,770.06	\$2,202.48	\$7,347.93
Hungary	\$1,545.20	\$35.53	\$52.90	\$52.91	\$116.50	\$114.36	\$241.89	\$141.31	\$471.44
India	\$16,121.30	\$370.71	\$551.91	\$552.02	\$1,215.50	\$1,193.16	\$2,523.62	\$1,474.31	\$4,918.61
Indonesia	\$8,571.20	\$197.09	\$293.43	\$293.49	\$646.25	\$634.36	\$1,341.73	\$783.84	\$2,615.07
Iran	\$3,826.10	\$87.98	\$130.99	\$131.01	\$288.48	\$283.17	\$598.94	\$349.90	\$1,167.34
Italy	\$19,995.30	\$459.79	\$684.54	\$684.67	\$1,507.59	\$1,479.87	\$3,130.06	\$1,828.59	\$6,100.56
Ivory Coast	\$481.90	\$11.08	\$16.50	\$16.50	\$36.33	\$35.67	\$75.44	\$44.07	\$147.03
Jamaica	\$1,000.73	\$23.01	\$34.26	\$34.27	\$75.45	\$74.07	\$156.65	\$91.52	\$305.32
Japan	\$84,968.20	\$1,953.84	\$2,908.88	\$2,909.44	\$6,406.38	\$6,288.59	\$13,300.90	\$7,770.42	\$25,923.79
Jordan	\$412.90	\$9.49	\$14.14	\$14.14	\$31.13	\$30.56	\$64.64	\$37.76	\$125.98

Table 3 (continued)

Projected savings in \$ million for 1997-2016 ^{9,10}									
Projected spending in \$ million	Bond Ratings								CCC-BBB ⁸
	AA-AAA ¹	A-AA ²	BBB-A ³	BB-BBB ⁴	B-BB ⁵	CCC-B ⁶	BBB-AAA ⁷		
Kenya	\$222.70	\$5.12	\$7.62	\$7.63	\$16.79	\$16.48	\$34.86	\$20.37	\$67.95
Korea, South	\$34,609.30	\$795.84	\$1,184.85	\$1,185.08	\$2,609.45	\$2,561.47	\$5,417.73	\$3,165.05	\$10,559.29
Kuwait	\$2,835.00	\$65.19	\$97.06	\$97.07	\$213.75	\$209.82	\$443.79	\$259.26	\$864.96
Luxemborg	\$1,604.40	\$36.89	\$54.93	\$54.94	\$120.97	\$118.74	\$251.15	\$146.72	\$489.50
Macedonia	\$1,977.40	\$45.47	\$67.70	\$67.71	\$149.09	\$146.35	\$309.54	\$180.83	\$603.30
Malaysia	\$12,558.90	\$288.79	\$429.95	\$430.04	\$946.91	\$929.50	\$1,965.97	\$1,148.52	\$3,831.72
Malta	\$951.70	\$21.88	\$32.58	\$32.59	\$71.76	\$70.44	\$148.98	\$87.03	\$290.36
Mauritius	\$977.60	\$22.48	\$33.47	\$33.47	\$73.71	\$72.35	\$153.03	\$89.40	\$298.27
Mexico	\$9,728.20	\$223.70	\$333.04	\$333.11	\$733.48	\$720.00	\$1,522.85	\$889.65	\$2,968.07
Morocco	\$2,581.90	\$59.37	\$88.39	\$88.41	\$194.67	\$191.09	\$404.17	\$236.12	\$787.74
Mozambique	\$79.00	\$1.82	\$2.70	\$2.71	\$5.96	\$5.85	\$12.37	\$7.22	\$24.10
Nauru	\$321.30	\$7.39	\$11.00	\$11.00	\$24.23	\$23.78	\$50.30	\$29.38	\$98.03
Netherlands	\$23,775.20	\$546.71	\$813.94	\$814.10	\$1,792.59	\$1,759.63	\$3,721.76	\$2,174.26	\$7,253.81
New Zealand	\$4,997.80	\$114.92	\$171.10	\$171.13	\$376.82	\$369.89	\$782.35	\$457.05	\$1,524.83
Norway	\$2,330.60	\$53.59	\$79.79	\$79.80	\$175.72	\$172.49	\$364.83	\$213.14	\$711.07
Pakistan	\$7,593.70	\$174.62	\$259.97	\$260.02	\$572.55	\$562.02	\$1,188.72	\$694.45	\$2,316.84
Peru	\$2,168.10	\$49.86	\$74.22	\$74.24	\$163.47	\$160.46	\$339.39	\$198.27	\$661.49
Philippines	\$7,995.80	\$183.86	\$273.74	\$273.79	\$602.86	\$591.78	\$1,251.66	\$731.22	\$2,439.52
Poland	\$3,253.20	\$74.81	\$111.37	\$111.39	\$245.28	\$240.77	\$509.26	\$297.51	\$992.55
Portugal	\$3,644.40	\$83.80	\$124.77	\$124.79	\$274.78	\$269.73	\$570.49	\$333.28	\$1,111.91
Romania	\$3,807.00	\$87.54	\$130.33	\$130.36	\$287.04	\$281.76	\$595.95	\$348.15	\$1,161.52
Saudi Arabia	\$11,140.00	\$256.16	\$381.38	\$381.45	\$839.93	\$824.48	\$1,743.85	\$1,018.76	\$3,398.81
Singapore	\$32,752.60	\$753.15	\$1,121.28	\$1,121.50	\$2,469.46	\$2,424.06	\$5,127.08	\$2,995.25	\$9,992.81
South Africa	\$6,769.20	\$155.66	\$231.74	\$231.79	\$510.38	\$501.00	\$1,059.65	\$619.05	\$2,065.28
Sri Lanka	\$2,353.30	\$54.11	\$80.57	\$80.58	\$177.43	\$174.17	\$368.38	\$215.21	\$717.99
Sudan	\$271.50	\$6.24	\$9.29	\$9.30	\$20.47	\$20.09	\$42.50	\$24.83	\$82.83
Swaziland	\$114.90	\$2.64	\$3.93	\$3.93	\$8.66	\$8.50	\$17.99	\$10.51	\$35.06
Sweden	\$11,333.90	\$260.62	\$388.02	\$388.09	\$854.55	\$838.83	\$1,774.21	\$1,036.50	\$3,457.97
Switzerland	\$13,130.50	\$301.94	\$449.52	\$449.61	\$990.01	\$971.80	\$2,055.44	\$1,200.80	\$4,006.11
Taiwan	\$22,139.80	\$509.10	\$757.96	\$758.10	\$1,669.28	\$1,638.59	\$3,465.76	\$2,024.70	\$6,754.85