

THE ECONOMIC IMPLICATIONS OF INTERNATIONAL SECURED TRANSACTIONS LAW REFORM: A CASE STUDY

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1. 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 International Institute for the Unification of Private law ("UNIDROIT") Convention on International Interests in Mobile Equipment as modified by the Aircraft Equip-

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***** Throughout this article, the authors have relied on general principles of economics that are not specifically cited in the text. For more information on these principles, the reader is invited to consult the following texts and treatises on economics and securitization: FRANK J. FABOZZI & FRANCO MODIGLIANI, CAPITAL MARKETS: INSTITUTIONS AND INSTRUMENTS; (2ed. 1996); ADVANCES & INNOVATIONS IN THE BOND AND MORTGAGE MARKETS (Franco Fabozzi, ed. 1989); CHRISTINE PAVEL, SECURITIZATION: THE ANALYSIS AND DEVELOPMENT OF THE LOAN-BASED/ASSET BACKED SECURITIES MARKETS (1989); ANTHONY SAUNDERS, FINANCIAL INSTITUTIONS MANAGEMENT: A MODERN PERSPECTIVE, (2d ed. 1997).

ment Protocol thereto ("Convention/Aircraft Protocol").¹ Economic and financial concepts, information economics, and transaction-cost economics are applied in a defensible framework for analyzing the gains and benefits associated with the law reform initiative.

This 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, their employees, their shareholders, and their customers; (2) governments and their country's national economies through improved transportation infrastructures, the size and structure of external debt, and increased commercial activity; and (3) manufacturers, their shareholders, employees, and suppliers.² This study demonstrates the mutuality and economic significance of the gains with reference to the commercial aircraft sector which, in turn, clearly may justify the efforts involved in designing and implementing the appropriate legal reforms.

2. THE MODALITIES AND IMPLICATIONS OF THE LAW AND FINANCE RELATIONSHIP: GENERAL PRINCIPLES

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

In recent years, there has been increased interest in the causalities resulting from legal system reform to financial market development, and from financial market development to economic growth. That is, it has been increasingly recognized that appropriate legal reforms can enhance the development and growth of financial markets, which have a positive effect on economic growth

¹ See Preliminary Draft UNIDROIT Convention on the International Interests in Mobile Equipment on Matters Specific to Aircraft Equipment, UNIDROIT 1998 Study LXXII-Doc. 42 [hereinafter Convention], Preliminary Draft Protocol to the Preliminary Draft UNIDROIT Convention on International Interests in Mobile Equipment on Matters Specific to Aircraft Equipment, UNIDROIT 1998 Study LXXIII-Doc. 3 [hereinafter Protocol].

² In many cases, such gains will be proportionally related to the applicability of the so-called optional provisions. See *infra* Section 4. These provisions were specifically designed to promote asset-based financing and leasing, and they may be agreed to by countries when ratifying the Convention/Aircraft Protocol.

by lowering the cost and increasing the availability of financing as well as promoting economic restructuring.³

For example, a recent study of the legal systems adopted by forty-nine 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.⁴ In turn, empirical studies by the World Bank and other organizations document 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.⁵ While financial development can be defined in many ways, such as the ratio of the amount of credit outstanding to its gross domestic product ("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 of these studies show that a strong causal link runs from financial development to the development and growth of national economies.⁶

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. Additionally, they can improve the process of corporate governance and serve as a bellwether for local and global portfolio investors.

³ See generally INGO WALTER, INSTITUTE OF SOUTHEAST ASIAN STUDIES, *HIGH PERFORMANCE FINANCING SYSTEMS* (1994).

⁴ See R. La Porta et al., *Legal Determinants of External Finance*, 52 J. FIN. 1131 (1997).

⁵ See generally WALTER, *supra* note 3.

⁶ Specifically, the evidence suggests the following: (1) 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; (2) capital market development seems to complement rather than substitute for bank finance, both of which seem to promote growth independent of each other; and (3) 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 generally FINANCE AND PRIVATE SECTOR DEVELOPMENT DIVISION, WORLD BANK, *FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: VIEWS AND AGENDA*, (1996).

A recent study has further shown that improved performance of the financial system aids mostly those industries that for technology-related reasons (e.g., project size, cyclical nature, engineering, complexity, and infrastructure characteristics) rely more heavily than other industries on external finance (i.e., financing other than through retained earnings).⁷ 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.⁸ The implication is that (1) industries which are more in need of, and which have access to, external finance develop disproportionately faster in countries with more developed financial markets and (2) 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 greater than the difference in these countries' growth rates in industries that are less technically complex (e.g., food, tobacco, and beverages).

2.2. *External Finance v. Internal Finance*

There are two broad ways in which any company (e.g., an airline) can finance its investments. The first is to use internal finance, such as net cash flows or net profits from operations. The second is to use external financing, such as raising funds in the debt, leasing, and (where they exist) equity markets or through government funding. For example, the average contribution of external finance to airline capital expenditures over the 1991-94 period alone was 76.7%.⁹ 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 sug-

⁷ See R.G. Rajan & L. Zingales, *Financial Dependence and Growth* (April 1997) (working paper on file with Department of Economics, University of Chicago).

⁸ For a complete discussion, see ANTHONY SAUNDERS, *FINANCIAL INSTITUTIONS MANAGEMENT: A MODERN PERSPECTIVE* 176-214 (2d ed. 1997).

⁹ See JET FINANCE S.A., *ANALYSIS OF THE COMPARATIVE ABILITY OF THE EUROPEAN AIRLINE INDUSTRY TO FINANCE INVESTMENTS* (Draft Final Report 1995).

gests 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. Such constraints and high costs 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 has important linkages to other industries and general economic performance.¹⁰

2.3. *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.¹¹ Obviously, not all borrowers have access to all of these alternatives. But even small or medium-size companies that are effectively 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.¹² Some of the gains from such activities will tend to be partially passed backward to the borrower. This value 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

¹⁰ See *infra* Section 7 (describing the macroeconomic gains associated with the Convention/Aircraft Protocol).

¹¹ Similarly, today's modern financial system provides a wide range of opportunities for investors which allow 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.

¹² See SAUNDERS, *supra* note 8, at 600-03 (outlining examples of securitization).

gateways that will be used. 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 Section 3.

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, along the financing continuum. Major airlines in countries with well-developed legal and financial systems would be positioned toward the right side of the chart, while airlines from developing countries would gravitate 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. It would also add asset-backed securities to the selection of alternatives available. With respect to the latter, the Convention/Aircraft Protocol would enhance the prospects of securitized financing to a wider spectrum of airlines.¹³

3. THE BENEFITS OF MOVING ALONG THE ASSET-BASED FINANCING CONTINUUM

3.1. *Unsecured Loans to Secured Loans: Barriers and Benefits*

In providing or supplying external finance, a key concern of a lender, investor, or lessor is the risk-adjusted return. For example,

¹³ 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 Convention/Aircraft Protocol. 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). Due to the first category of risk being substantially eliminated, the cost associated with such residual political risk should be lower than those contained in current political risk calculations.

the return on debt contracts, such as loans and bonds, is constrained to a maximum upside of an interest payment plus return of principal.¹⁴ However, on the 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, lender, or 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.¹⁵

Virtually all aviation industry lenders require such security.¹⁶ The prevalence of secured financing in the aviation industry is attributable to a number of factors including: (1) the strong projected residual values and lengthy useful lives of aircraft equipment; (2) the cyclicity of the aviation industry combined with the requirements for long-term financing of aircraft equipment; and (3) the magnitude 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, or 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 a 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. When assessing the extent to which its loan is truly asset-based, and thus worthy of risk

¹⁴ 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. Upon maturity of a financial lease (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.

¹⁵ See SAUNDERS, *supra* note 8, at 176-214.

¹⁶ See *id.*

analysis, taking account of the anticipated value of the collateral,¹⁷ a lender must ask this essential question: on the borrower's default, can the lender 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 Convention/Aircraft Protocol embodies asset-based financing concepts, and thus, to what extent their enactment in a particular country will result in the benefits discussed in this study.

The key principles underlying the lender's ability to extend asset-based financing are that a financier or lessor: (1) 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; (2) 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 (3) will not have their rights described in (1) and (2) 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 economically valuable¹⁸ depends

¹⁷ A basic premise underlying the analysis in this study is that the trade-off between returns and risk are efficient. The implications of this proposition are that, for a given borrower, (1) the risks and returns in an asset-based financing are lower than in an unsecured financing, and (2) 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 Convention/Aircraft Protocol lies not merely in its encouragement of asset-based finance (where asset-based financing would otherwise be unavailable) but also in its potential for the rationalization of pricing. This means there are 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.

¹⁸ Such value lies in the economic benefits discussed in Sections 5, 6, and 7 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.

crucially on three key factors: (1) the quality and transparency of the registry of property interests; (2) the speed with which legal enforcement is available; and (3) the ability to enforce contractual rights when a borrower or lessee is bankrupt or insolvent.¹⁹

As has been noted in previous studies, many legal systems do not embody asset-based financing principles.²⁰ In many developing countries, the ability of creditors to establish and enforce claims against debtors has been notably weak. Often, the priority of claims in national registries of security interests are non-transparent, and legal enforcement of claims can take years.²¹ 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.²² 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, and the greater the opportunity cost and 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 borrower²³ so that higher interest rates or leasing costs may ac-

¹⁹ See SAUNDERS, *supra* note 8, at 176-214.

²⁰ See, e.g., Heywood Fleisig, *The Power of Collateral: How Problems in Securing Transactions Limit Private Credit for Movable Property*, in PUBLIC POLICY FOR THE PRIVATE SECTOR (The World Bank), Apr. 1995, at Note 43 (1995).

²¹ See SAUNDERS, *supra* note 8, at 176-214.

²² See *id.*

²³ Technically, these reasons are related to adverse selection and moral hazard. For example, in order to pay very high interest rates, a borrower may

tually 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. Accordingly, in countries where the perfection, enforcement, priority, and/or bankruptcy re-arrangements 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 embodies the asset-based financing principles.²⁴ 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.

3.2. *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.²⁵ That is, while the posting of collateral can lower external financing costs, and an assured prompt legal claim on collateral can lower them even further, the replacement of asset-backed loans by asset-backed bonds has the potential to lower the costs of external financing even more.²⁶ The ability of asset-backed bonds to reduce financing costs requires well-developed legal and financial systems, or access to such systems through cross-border finance. Due to their complexity, asset-backed bonds 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 providing access to a deeper source of funds, asset-backed bonds have enormous potential to reduce the cost and increase the availability of external financing to those firms, such as commercial air carriers, that are heavily dependent on external finance.

be induced to accept increased risk so as to repay the loan. See, e.g., Joseph E. Stiglitz & Andrew Weiss, *Credit Rationing in Markets with Imperfect Information*, 71 AM. ECON. REV. 393, 393 (1981).

²⁴ See Fleisig, *supra* note 20 (showing that significant external finance costs and availability differences exist between Argentina and Bolivia on the one hand, and the United States on the other, because of the greater degree to which requirements for asset-based financing principles are satisfied in the United States).

²⁵ See SAUNDERS, *supra* note 8, at 176-214.

²⁶ See *id.*

Specifically, bank loans by themselves are rather illiquid for the originator (usually a 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.²⁷ 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 investors. Currently, a growing portion of major-airline finance is in the form of such syndicated loans.²⁸ 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.²⁹ Very little secondary market trading/selling takes place in these loans after origination and prior to maturity. 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.³⁰

One way in which asset liquidity can potentially be enhanced and the cost of funds reduced is through 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 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 they can "pass-through" cash flows received on the assets in the pool to the bondholders, through 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

²⁷ In fact, a significant proportion of aircraft loans are currently held by European and Japanese universal banks. See JET FINANCE, *supra* note 9.

²⁸ See generally FRANK J. FABOZZI & FRANCO MODIGLIANI, CAPITAL MARKETS (1996).

²⁹ For example, loan sales peaked from 1987 to 1989 but have since declined. One reason for this decline is that the volatility of credit risk is now lower than it was at the end of the 1980s. See THE LOAN PRICING CORPORATION, GOLD-SHEETS. The lower the volatility of credit risk, the lower the attraction of loan trading.

³⁰ See FABOZZI & MODIGLIANI, *supra* note 28.

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. Furthermore, the overall cost of funds are lower for the originating bank or corporation than the costs associated with a single-class bond issue, and the collateralized bonds can be traded more easily in secondary markets than loans, thus representing more liquid instruments.³¹

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.³² 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 into the vast pool of liquid assets in the national and global securities markets.³³

Securitization occurs when an asset holder finds it desirable to liquidate or restructure its balance-sheet. This may occur for reasons of profitability, interest rate and liquidity mis-matches of its assets and liabilities, or 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 first use of pass-through bonds involving government agencies as quasi-guarantors to securitize fixed rate mortgage loans

³¹ See Karl P. Essig, *Pass-Through Certificates Backed by Lease Payments for Commercial Aircraft*, in THE HANDBOOK OF ASSET BACKED SECURITIES 453, 453-460 (Jess Lederman ed. 1990); Richard Jory, *Leading by Example, International Securitization Report*, 20 IFR TRANSPORT FIN. (Oct. 1996); Richard Jory, *Leased But Not Last, International Securitization Report*, 18 IFR TRANSPORT FIN. (June 1996).

³² See SAUNDERS, *supra* note 8, at 176-214.

³³ See *id.*

in the early 1970s,³⁴ the securitization technique has been successfully extended to a variety of other assets.³⁵ As the transaction costs of using available securitization technology have declined, the advantages to financial institutions have become more apparent.³⁶

The potential of asset securitization is demonstrated by looking at the far greater trading volume of emerging-market Brady bonds compared to the trading volume of emerging-market bank loans. The greater trading volume suggests that the liquidity of bonded debt is generally much higher than tradeable bank debt.³⁷ 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.³⁸

The foregoing suggests a large potential investor appetite for asset-backed securities related to aircraft financings as well as 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 fundamentally change legal structures to embody asset-based financing principles.³⁹ The reason for this growth is simple; that form of financing, to the extent viewed and priced by institutional investors as presenting lower risks than other forms of credit extension, on account of assured and timely recourse to highly valued aircraft equipment, by necessity presupposes the legal means to achieve that risk reduction.

³⁴ See Lakhbir S. Hayre & Cyrus Mohebbi, *Mortgage Pass-Through Securities*, in *ADVANCES & INNOVATIONS IN THE BOND AND MORTGAGE MARKETS* 259, 259-303 (Frank Fabozzi ed., 1989).

³⁵ Andrew Carron et al., *Asset Backed Securities*, in *ADVANCES & INNOVATIONS IN THE BOND AND MORTGAGE MARKETS*, 527, 527-542 (Frank Fabozzi ed., 1989).

³⁶ These advantages include an increased asset liquidity and a superior ability to manage interest-rate risk exposures, resulting in potentially all bank loans becoming securitizable. See *id.*

³⁷ See ROY C. SMITH & INGO WALTER, *GLOBAL BANKING* (1997).

³⁸ See *id.*

³⁹ See FABOZZI & MODIGLIANI, *supra* note 28.

3.3. Commercial Aircraft Securitizations

Up to this point, securitization of commercial aircraft-related assets has been done on a small scale.⁴⁰ 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 is issued (this is usually called an "Equipment Trust Certificate").⁴¹ 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. These pools proved that both lease payments and the proceeds from aircraft sales are to be "passed-through" to investors to cover the interest and principal due on the bonds.⁴²

These securitization packages are invariably complex, and require various credit-risk guarantees and liquidity guarantees to investors in case the airlines default on their leases and the associated payments. Importantly, many airline securitization packages that originated in the United States are rated, thereby becoming marketable by virtue of the fact that investors are protected by Section 1110 of the U.S. Bankruptcy Code ("Section 1110").⁴³ 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.⁴⁴

⁴⁰ 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.

⁴¹ See FABOZZI & MODIGLIANI, *supra* note 28.

⁴² The pass-through of asset proceeds creates a potential early call risk feature labeled prepayment risk. As a result, bonds may be retired earlier than expected if cash flows are larger than projected.

⁴³ See P. Baggaley, *Criteria for Enhanced Equipment Trust Certificates*, STANDARD & POOR'S GLOBAL SECTOR REV. Aug. 1995, at 18.

⁴⁴ See Bankruptcy Reform Act, 11 U.S.C.A. §1110(a) (West 1994). Because of the 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. See *id.* at §1110(a)(1)-(a)(2).

3.4. *Section 1110 and Rating Enhancement: The Paradigm*

Section 1110 protection, with respect to the cost of external asset-backed financing available to the airline industry is significant because the major international credit rating agencies will give a rating enhancement of up to two notches to debt issues so protected.⁴⁵ Such rating enhancements can have a material effect on the cost of funds facing the issuer. Further reductions are possible, provided that other 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 (such enhanced issues will be referred to as “Enhanced Equipment Trust Certificates”).⁴⁶ For example, over-collateralization by a specific factor or more can result in three full category rating upgrades under Standard & Poor’s rating standards.⁴⁷

4. CHARACTERISTICS OF THE PROPOSED CONVENTION/ AIRCRAFT PROTOCOL PROMOTING ASSET-BASED FINANCING AND SECURITIZATION

This section provides background to the assessment of gains and benefits from adoption of the Convention/Aircraft Protocol; discussed in Sections 5 through 7, by considering the extent to which these legal instruments contain asset-based financing and securitization-promoting characteristics discussed previously. For simplicity, we will assume the terms of these legal instruments as summarized throughout the article. In particular, provisions that are mandatory (i.e., those that apply to all ratifying countries) 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.”

⁴⁵ For example, the Standard & Poor’s rating will be raised from B to BB. See FABOZZI & MODIGLIANI, *supra* note 28.

⁴⁶ See Bagdaley, *supra* note 43.

⁴⁷ See *id.*

4.1. *Asset-Based Financing Characteristics*

There are three basic asset-based financing principles that permit central consideration of asset values in any rational risk/return financing assessment. First, a financier or lessor must be able to determine and guarantee 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 re-deploy 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."

4.1.1. *Treatment of the Transparent Priority Principle Under the Convention/Aircraft Protocol*

An essential feature of the Convention/Aircraft Protocol is the establishment of an international registry system in which all security and leasing interests in, and transfers of, aircraft equipment must be registered in order to ensure their priority against third parties.⁴⁸ With one exception, such priority will be determined on a first-in-time basis. The exception runs in favor of so-called "preferred national creditors," categories of non-consensual creditors, such as tax creditors and repairers, designated as such by countries during their ratification of the Aircraft Protocol.

The basic convention rules create an international registration system and concomitant priority framework that are consistent with the transparent priority principle. The rules will eliminate the risk of secret or hidden (consensual) interests in aircraft. They will thus facilitate asset-based financing, 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.⁴⁹

⁴⁸ See FABOZZI & MODIGLIANI, *supra* note 28.

⁴⁹ This international registry system is analogous— in economic terms— to an international clearinghouse of ownership and other proprietary claims. Viewed in these terms, it has the potential to enhance the liquidity of the debt

In contrast, preferred national creditors are, in effect, hidden lien-holders. While there are undoubtedly strong reasons for countries to designate certain creditors as preferred national creditors (such as encouraging prompt repair of damaged equipment), such designations should be limited to ensure the maximum economic benefit of the Convention/Aircraft Protocol. The more limited this category, the more these asset-based financing principles will be respected, and thus risk/return assessments will reflect such principles.

4.1.2. *Treatment of the Prompt Enforcement Principle Under the Convention/Aircraft Protocol*

The Convention/Aircraft Protocol provides financiers and lessors with the ability to take possession of and sell or redeploy aircraft equipment in the case of default under the basic convention rules.⁵⁰ Their ability to do so promptly (and to take other actions necessary for the practical realization of these intended remedies, such as the ability to de-register and export the aircraft), however, are contained in optional convention rules of two kinds.⁵¹ First, countries may agree that these remedies will be available without judicial assistance or intervention, meaning a country may permit or prohibit non-judicial remedies (so-called “self-help”).⁵² Even if

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 clearinghouses, depositories, and registries for Eurobonds allowed the cross-border trading in these instruments to develop rapidly. See Ian Giddy, et al., *Securities Clearance and Settlement Prospects for Convergent Markets*, 28 J. MONEY, CREDIT & BANKING 689 (1996). The resulting efficiency gains to issuers and investors in the Eurobond market were spectacular.

⁵⁰ See Convention, *supra* note 1, at arts. 9-14; Protocol, *supra* note 1, at arts. IX-XV.

⁵¹ The optional Convention/Aircraft Protocol rules will apply if, and only if the relevant contracting state has not entered a reservation in respect of the same at the time of ratification of the Convention/Aircraft Protocol and the transaction parties have not excluded the applicability of such rules in their transaction documents. See Convention, *supra* note 1, at arts. 4, 6, Y, and Z; Protocol, *supra* note 1, at arts. XXV-XXXIII.

⁵² The proposed aircraft protocol includes a provision sanctioning the use of a form of international irrevocable deregistration authorization. See Protocol, *supra* note 1, at art. XIII. This would make the basic remedies available upon the occurrence of a remedies event exercisable (with some exceptions) without the necessity of the judicial process, assistance, or intervention, making it the functional equivalent of a non-judicial remedy.

such unilateral creditor action is permitted by a particular country, it may be restricted to the extent that such action breaches the peace. A second, and potentially effective, optional convention rule requires countries to institute judicial proceedings relating to the asset (although not to ultimate liability) on a "speedy" basis (the "general expedited relief rule") or, alternatively, within a maximum timetable (the "specific expedited relief rule").⁵³

The applicability of one or both of these sets of optional convention rules is essential to maximizing the potential financing-related benefits of the legal instruments in a given country, particularly, but not exclusively, in countries where the risk of material enforcement delays is currently a key factor in risk/return lending assessments.⁵⁴

4.1.3. *Treatment of the Bankruptcy Law Enforcement Principle Under the 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

⁵³ The expedited relief rule is an optional rule contained in Article 15 of the Proposed Convention/Aircraft Protocol. The expedited relief rule states that 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 merits of a dispute, shall not affect the ultimate liability of the transaction parties as determined in a full trial. The forms of such relief are broad, including: (a) preservation of the aircraft equipment or its value; (b) possession, custody, or management of the aircraft equipment; (c) sale or lease of the aircraft equipment; (d) application of proceeds or income relating to the aircraft equipment; and (e) immobilization of the object. This general provision will require that such relief be available on a speedy basis. See Convention, *supra* note 1, at art. 15. Furthermore, under article X of the Protocol, 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 thirty days from the date such relief is sought. See Protocol, *supra* note 1, at art. X. This general Convention rule shall be referred to as the general expedited relief rule, and such rule as supplemented by the Protocol's binding timetable shall be referred to as the specific expedited relief rule.

⁵⁴ See *infra* Section 6.2.

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

The optional convention rule named the "international insolvency rule" will, together with the rules described above, permit countries to implement 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 against the competing economic and non-economic values that underlie their existing rules.

4.2. *Characteristics Promoting Asset-Backed Lending and Securitization*

Asset-backed lending and securitization of commercial aircraft-related assets offer the potential both to 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,⁵⁵ the Convention/Aircraft Protocol have the potential to promote both lower-cost asset-backed bank lending and securitized financing. Their ability to do so, however, is directly linked to the applicability of the optional provisions,⁵⁶ particularly the timetable elements of both the specific expedited relief rule⁵⁷ (applicable to non-bankruptcy enforcement), and the international insolvency rule⁵⁸

⁵⁵ See *supra* note 13. An annotation to the 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 Convention/Aircraft Protocol, would further reduce (although not eliminate) political risks in countries that do not "opt out," thereby increasing the economic value of the proposed instruments.

⁵⁶ It is imperative that the wording of these provisions be objective and clear so that national courts will be forced to apply uniform standards, thereby diluting the required predictive nature that is essential to secured or securitized transactions.

⁵⁷ See *supra* note 53 for an explanation of the specific expedited relief rule.

(applicable to bankruptcy enforcement) where and to the extent that the rules of particular legal systems are unclear or open ended on these issues. Finally, in order to maximize the investor base in such securitized transactions, continued capital market reform remains desirable.

5. ESTIMATES OF FUND AVAILABILITY AND COST SAVINGS RESULTING FROM THE ADOPTION OF THE CONVENTION/AIRCRAFT PROTOCOL

5.1. *General Background, Methods, and Assumptions*

Aircraft manufacturers have projected a rapid growth in new aircraft demand and passenger miles over the next twenty years, most notably in emerging markets.⁵⁹ 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.

Given this tremendous overall expected growth, plus the faster relative growth rate in purchasing needs of developing and emerging market country airlines, the questions of availability and cost of external finance become crucial. It is in the context of this large projected expansion in new aircraft and related equipment purchases over the next twenty 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.

⁵⁸ The international insolvency rule is an optional rule that states that within a specified time of an insolvency event, which in addition to the commencement of traditional insolvency or bankruptcy proceedings includes declarations of nonpayment of creditors of the equipment user, the equipment user must either cure all defaults under the transaction documents or 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 30-60 days or such shorter period, if any, under the national insolvency law in which the equipment is required to cure all defaults or return the aircraft equipment to the equipment financier/lessor.

⁵⁹ See AIRBUS INDUSTRIE, GLOBAL MARKET FORECAST (1997); BOEING, 1997 CURRENT MARKET OUTLOOK (1997).

5.2. *Increased Funds Availability and Reduced Financing Costs Under the Convention/Aircraft Protocol*

As discussed in Section 3, 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 their prospects of accessing international capital markets.⁶⁰ The associated increase in availability of funds and reduction in world airlines' external interest costs—and thus overall 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 tap⁶¹ 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.⁶² A second source of benefit will be the potential⁶³ 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 to reduce debt-service ratios.⁶⁴

5.3. *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.,

⁶⁰ 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 e.g. *supra* note 13.

⁶¹ As noted earlier, due to excessive risk, certain borrowers are unable to access loans at any price.

⁶² For example, to the extent that emerging market airlines are credit-rated, this is conceptually equivalent to their facing an "infinite" cost of funds.

⁶³ A number of considerations, including any perceived risk of non-compliance with the 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 permitting greater reliance on asset values in overall assessments of risk—reduces the need, in varying degrees, for sovereign support. For further discussion, see *infra*, Section 7.5.

⁶⁴ This is especially relevant for IMF-type restrictions on sovereign debt.

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 very 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 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.⁶⁵ 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.⁶⁶

⁶⁵ THE AVIATION AEROSPACE ALMANAC (Richard Lampl et al. eds., 1997).

⁶⁶ In addition, it should be noted that no current aircraft equipment transactions are wholly supported by export credit financing, and most outside 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. Additionally, 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. See *id.*

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 in order to, among other things, reduce their sovereign debt exposure. 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.

5.4. *An 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 (“Reform Act”) resolved many uncertainties regarding the application of Section 1110 to secured creditors in U.S. airline bankruptcies.⁶⁷ By analyzing the market pricing and returns on U.S. airline stocks before and after the passage of the Reform Act, through the use of 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. This, as a conceptual matter, is one way of characterizing the reform contemplated by the Convention/Aircraft Protocol.

In an efficient equity market, the stock market values of companies reflect the current and expected future earnings (dividends) of that company. In particular, any regulatory reform that is viewed as favorable for the profitability of a company should be impounded in the valuation of its tradeable equities (i.e., by an ap-

⁶⁷ See P. Baggaley, *Higher Ratings for Airline Equipment Debt*, STANDARD & POOR'S GLOBAL SECTOR REV., Aug. 1995, at 17.

preciation in the share price). The methodology used to evaluate the 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 (airline stocks in this case) is well established.⁶⁸ The methodology involves looking at the performance of the share prices of the affected companies 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, resulting in a two-week return of 9.73% in the period immediately surrounding the Act's passage.⁶⁹ 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, resulting in a two-week return of 1.05%.⁷⁰

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 there was a 4.65% two-week abnormal return on airline stocks due to the passage of the Bankruptcy Reform Act.⁷¹ Given an initial equity market valuation of the publicly

⁶⁸ See John J. Binder, *Measuring the Effects of Regulation with Stock Price Data*, 16 RAND J. ECON. 167, 167-70 (1985).

⁶⁹ See *id.* at 167-83.

⁷⁰ See *id.*

⁷¹ To calculate the abnormal return on airline stocks over the weeks ending October 21 and October 28, 1994, the weekly Standard & Poor's ("S&P") return on airline stocks ("SPAIR") is regressed on the weekly returns on the S&P index ("SPX") over the two year period September 1993 through October 1995 (or 102 weeks). The normal or expected sensitivity of airline stocks to the movement in the market index (the so-called 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 one for the weeks October 21 and October 28, 1994 and equal to zero for all other weeks in the two-year regression period. The results of this regression are $SPAIR = -0.49 + 1.32SPX^* + 4.65$

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).⁷²

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? One potential source of improved expected future profitability is a reduction in required interest spreads or "premiums" (over the risk free rate) demanded by investors on airline bonds as a result of lower credit risk and liquidity risk exposures. These lower credit and liquidity risks are a result of the 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 ten-year U.S. Government Treasury bond as a risk-free benchmark, the mean monthly spreads of airline bonds fell eight basis points, from 2.41% to 2.33%, in the year after the Act's passage.⁷³

It should be noted that the upgrade of airline debt and the commensurate reduction in financing costs attributable to the proposed Convention/Aircraft Protocol are 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

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 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.

⁷² See *id.*

⁷³ The monthly average percentage spread (i.e., the spread divided by the level of ten-year government yields) also fell from 0.267 in the year before the Act's passage to 0.253 in the year following, constituting a decrease of 5.2% in the percentage spread. These figures are based on yield quotes available in monthly Standard & Poor's Bond Statistics (Data Series) and reflect end of the month yields. It should also be noted that these are unweighted, or simple, averages of all available bonds.

the proposed Convention/Aircraft Protocol. It is conservative 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 non-rated and non-investment-grade airlines and countries, so the upward rating migration is likely to be much more dramatic.⁷⁴

5.5. *Global Airline Financing Cost Savings*

Currently, most airline purchases must occur in U.S. dollars. This requires airlines to either raise external funds by borrowing dollars directly, through secured bank loans, leases, dollar-denominated bonds, or export credit, or borrow in its local currency and convert the proceeds into U.S. dollars.⁷⁵ 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, and 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.⁷⁶ At present, the latter are mostly developing and emerging-market countries which find it difficult or costly to directly access either the commercial dollar loan or dollar bond markets at low cost, or in some cases, at any cost at all.⁷⁷

The objective of this section is to calculate hypothetical "what if" financing cost savings that may result from a greater ability of airlines world-wide to use private, commercially priced, asset-

⁷⁴ For example, Canada announced and passed an amendment to its Bankruptcy Act, similar to Section 1110 of the U.S. Bankruptcy Code. See Bankruptcy and Insolvency Act, R.S.C. (1985) (Can.). The proposed amendment was aimed, among other things, at Canadian railroads. By using the same methodology on Canadian railroad stocks as used for the passage of the U.S. Bankruptcy Code on U.S. airlines stocks, the Toronto Stock Exchange index of railroad stocks increased 1.07% in the week of the announcement of the Canadian Bankruptcy Act amendment after adjusting for movements in the market and the sensitivity of railroad stocks in general (the "beta"). However, the reaction had a very weak significance. In particular, it is not statistically significant at the 90% confidence level.

⁷⁵ The developed countries' airlines also have potential access to dollar equity markets to raise additional external funds.

⁷⁶ See JET FINANCE, *supra* note 9.

⁷⁷ See *id.*

backed financing as a result of the passage of the proposed Convention/Aircraft Protocol. This entails estimating the interest cost savings per dollar of aircraft financing by moving from relatively unsecured commercial borrowings to secured borrowings. In the absence of export credit, airlines, particularly 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 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 which are beyond the scope of this study, may still enjoy sovereign guarantees, the value of which depends on the level of sovereign creditworthiness⁷⁸. 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 projected purchases of aircrafts by 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-rationed airlines initial access to those markets, the estimated costs savings actually represent underestimates of the true potential gains from the passage of the proposed Convention/Aircraft Protocol.

5.6. *Dollar Financing Cost Savings*

Some airlines, especially those from developed countries, already have commercial access to U.S. dollar bank loans, 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. The Protocol will also increase the commercial access of

⁷⁸ 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 supported airlines reflect the credit standing of the government guarantor. In a number of recent cases, market and risk assessors viewed the credit standing as unstable. See Roy Smith & Ingo Walter, *Risks and Rewards in Emerging Market Investments*, J. APPLIED CORP. FIN., Fall 1997, at 1.

airlines from developing countries that currently rely on export-trade credit or sovereign guarantees, or 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).

5.7. *Financing Cost Savings: Secured Loans in Unfavorable v. 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 rate may reflect the cost of borrowing to an airline from a developing country that is 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, consisting of interest and principal repayments. According to bankers, a common maturity for an aircraft loan is twelve years.⁷⁹ A hypothetical "secured loan" transaction, with minimal legal or political risks, might take place at or around LIBOR plus forty basis points,⁸⁰ whereas a hypothetical "unsecured transaction,"⁸¹ assuming it is acceptable at all, might take place at LIBOR plus 250 basis points.⁸² 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

⁷⁹ Telephone interview with Tom Gallagher, CIBC (1998). We would like to thank Tom Gallagher for his input and advice concerning the standard features of loan contracts for airline purchases.

⁸⁰ 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 rated transaction.

⁸¹ For our purposes, 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 of the transaction.

⁸² 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.

high rates, preferring instead to credit-ration such borrowers, though they may continue to have access to operating leases.

One way of considering potential savings and savings ranges associated with the Convention/Aircraft Protocol is by computing the present-value cost savings of interest payments on a secured loan financing of one dollar versus an unsecured loan financing of one dollar using various interest rate spreads above the average 1995 LIBOR plus forty basis points and an assumed twelve-year fixed rate aircraft mortgage. These savings can be computed on both a total and an annualized basis. The savings increase, with the size of the spread between the actual lending rate and the "secured lending rate," is assumed to be LIBOR plus forty basis points. For example, if the borrower in the relatively unsecured transaction had to pay a loan rate of LIBOR plus 190 basis points (or an extra spread over the secured rate of 150 basis points), it would save nine cents per dollar (or 9%) of principal borrowed over the life of a twelve-year loan, if moved to a secured loan financing. This results in an average annual interest savings over the twelve-year period of 3/4% of the principal borrowed. Thus, for a \$100,000,000 aircraft purchase, the annual average interest savings over the twelve-year life of a loan would have a present-value of \$7,500,000. Our calculations indicate that if the borrower had to pay LIBOR plus 150 basis points (or a spread over the secured rate of 110 basis points), the net present value savings would be six cents per dollar over the life of the loan, while a borrower currently paying LIBOR plus ninety basis points (or a spread over the secured rate of fifty basis points) would save three cents per dollar borrowed.

Underlying the approach here is the notion of comparative improvement. The actual cost savings in a particular country and to a particular carrier will depend principally upon the comparative improvement embodied in the proposed Convention/Aircraft Protocol judged against otherwise applicable national legal rules and the relationship between legal and other perceived risks in a particular transaction. The greater the comparative improvement, the greater the benefit.

5.8. *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 United States or in the Eurobond markets. Most bonds require

periodic payments 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.

This section considers, again by analogy to current credit rating agency methodology, the potential benefits of the proposed Convention/Aircraft Protocol in connection with bond financing. The previous comments on comparative improvement and 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 twelve-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. Based on 1992-95 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% (or AAA). Over the twelve-year life of the bond, the present-value of the coupon or interest savings per one dollar of face value amounts to two cents per one dollar of financings or 0.16% per annum.

In the case of a similarly-calculated one-category rating upgrade (e.g., from CCC to B, from B to BB, etc.), the cost savings are greatest for the lowest (most risky) borrowers. For example, a one-category upgrade by a CCC borrower to B results in a present-value savings of sixteen cents per dollar of financing over the twelve-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 twelve-year bond, or \$1,333,333 on an annual basis.

There are proportionately greater potential savings per one dollar on more than one-category upgrades. Such savings 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, or in other words, investment-grade. This results

in a present-value cost saving of thirty-one cents per dollar of financing over twelve years (or an average annual savings of 2.6%). For a BBB-rated borrower, a three category upgrade (to AAA) would result in a nine cents per dollar present-value cost savings over twelve years (or an average annual savings of 0.75%).

The maturity structure of new emerging-market loans and securities issued during 1989-97 involved the far longer maturities of bond issues in recent years, rising to almost twelve years in 1997, as compared to about four years for bank loans. In all, about fifty countries were covered by the bond rating agencies in 1997, a number that has increased steadily since the late 1980s. About half of these countries are rated below investment grade.⁸³

5.9. *Per Dollar and Total Projected Cost Savings*

In the preceding sections we have calculated the 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 twelve-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 hypothetical potential figures for a country-by-country aggregate dollar savings presented below are based on actual dollars spent on airline purchases during 1992-97 and projected expenditures for 1997-2016 provided by Airbus and Boeing. The calculations crucially assume that the savings accrue because 100% of financing is achieved through one particular mechanism rather than another (e.g., fully secured dollar loans versus less heavily secured dollar loans).

For example, to the extent that 15% or 30% or 75% of financing is achieved through a particular means, with other financing sources being used (e.g., equity, export credit financing, or leasing) to finance the balance, the results of these computations can be directly adjusted by multiplying these projected savings figures by the percent of financing derived from a particular source. Because of the wide differences in financing sources used by airlines and the lack of precise country-by-country information on use of these sources between equity, bonds, export credit, loans, and leasing (as well as the

⁸³ See generally STANDARD & POOR'S CORP. DATA.

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.

5.10. *Hypothetical Savings for 1992-97 Using Dollar Finance*

In this Section, we take a very simple approach to calculating hypothetical financial savings. This approach assumes that commercial conditions prevail⁸⁴ and 100% of the necessary finance, for purposes of comparison, is raised with an average maturity of twelve years. To estimate the savings, we take actual dollars spent on aircraft acquisitions on a country-by-country basis during the 1992-97 period and multiply these figures by the estimated cost savings if they had used 100% secured, twelve-year fixed-rate dollar borrowing versus relatively unsecured dollar borrowings for financing actual aircraft acquisitions (i.e., LIBOR plus forty basis points versus LIBOR plus ninety basis points) plus a range of higher spreads. For example, if the weighted average loan spread for 1992-97 commercial aircraft deliveries were reduced from LIBOR plus 190 basis points to LIBOR plus forty basis points (a spread savings of 150 basis points), the present value savings would have been approximately \$18 billion (or, on average, \$1.5 billion annually over the life of the assumed twelve-year loans). A spread reduction of just fifty basis points (i.e., from LIBOR plus ninety basis points to LIBOR plus forty 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. Such estimates are based on actual aircraft purchases, 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.

⁸⁴ See, e.g., *supra*, Section 5.3 (discussing the inapplicability of export credit financing to the methodology employed in this study).

5.11. *Projected Potential Savings for 1997-2016 Using Dollar Finance*

One can forecast the savings by using projected aircraft acquisition expenditures for 1997-2016 (in 1997 dollars) as the amount of financings needed.⁸⁵ Once more, a weighted average loan spread reduction from 190 to forty basis points over LIBOR (or a spread reduction of 150 basis points) would cut financing costs by over \$90 billion on a present value basis, over \$7.5 billion annually for a twelve year financing. A spread reduction of just fifty basis points (from LIBOR plus ninety basis points to LIBOR plus forty basis points) would result in present value savings of over \$30 billion, approximately \$2.5 billion per annum for a twelve-year financing. A similar analysis follows when assuming bond finance of projected 1997-2016 aircraft savings over a twelve-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 prevailing commercial conditions and 100% sourcing of the financing method. As noted earlier, one can multiply these figures by any given smaller percentage (e.g., 15%) to generate scenarios in which parties raise the required amount funds largely through non-commercial mechanisms.

5.12. *Summary of Financing Cost Savings*

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 nine cents per dollar financed. If interest rate spreads decrease by 150 basis points, the savings from dollar bond financings will differ by the initial rating of the borrower (or the borrower’s home country) and the degree of over-collaterization 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 thirty-one cents per dollar for an upgrade from CCC to BBB (or between 0.16% and 2.6% per annum). Moreover, airlines

⁸⁵ This projection is based on consensus aircraft delivery forecasts by Airbus and Boeing.

that currently lack access to such financing markets may have that access under the Convention/Aircraft Protocol regime.

6. ESTIMATES OF PASS-THROUGH TRANSACTION COSTS 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 Section 5 and appears to be significant on a stand-alone basis. However, the Protocol offers 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 transaction costs 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. However, all of these comprise further types of microeconomic benefits that the proposed Convention/Aircraft Protocol would convey to various clusters of industry participants, whether aircraft operators, customers, suppliers, or financiers.

6.1. *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 for example, in terms 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 cost savings benefits of the proposed Convention/Aircraft Protocol passed through to the end-users in lower fares, the greater will be the increase in demand for air transportation and the greater the increase in demand 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 com-

petitive structure of the various relevant markets for air transport services. However, based on estimates of the elasticity of air fares with respect to cost and the elasticity of demand for airline services with respect to fares, recent U.S. studies have shown that every 1% reduction in airline costs can lead to between a 0.33% and 0.5% reduction in airline passenger fares.⁸⁶ 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 elasticity suggests that for every 1% estimated reduction in costs there could be between a 0.53% (0.33% x 1.6%) and 1.25% (0.5% x 2.5%) expansion in air passenger traffic. However, the aforementioned demand elasticities for air transport services would most likely not 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 translates into a potential expansion of passenger air traffic of between .053% (0.33% x 1.6% x 0.1%) and .25% (0.5% x 2.5% x 0.2%). For example, a potential present-value reduction of 9% in financing costs by moving from unsecured to secured dollar loans over twelve years⁸⁷ translates into a potential long-term increase in air passenger-kilometers traveled assuming the above cost and demand elasticities of between 0.47% (9 x .053%) and 2.25% (9 x .25%).⁸⁸ 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 11.3 and 54.2 million passenger-kilometers once the full adjustment

⁸⁶ See J.A. Brander & Anming Zhang, *Market Conduct in the Airline Industry: An Empirical Investigation*, 21 RAND J. ECON. 567, 567-83 (1990); Jan K. Brueckner & Pablo Spiller, *Economies of Traffic Density in the Deregulated Airline Industry*, 37 J.L. & ECON. 379-437 (1994); Margaret A. Peteraf & Randal Reed, *Pricing and Performance in Monopoly Airline Markets*, 37 J.L. & ECON. 193 (1994).

⁸⁷ For illustrative purposes, this is the hypothetical saving if secured loans reduce spread by 150 basis points (e.g., from LIBOR, 190 basis points to LIBOR plus 40 basis points). See *supra* Section 5.7.

⁸⁸ These numbers can be annualized by dividing these figures by 12.

has taken place and assuming full pass-through of the financial cost savings.⁸⁹ This fact, of course, translates into a significant potential gain in global airline revenues.

6.2. *Reductions in Transaction 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 (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, re-deploy 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.⁹⁰ The potential cost savings in this regard flows from the general upgrade and harmonizing of the proposed legal instruments, particularly to the extent that they lead 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 conditions of financial distress, (i.e., selling aircraft at a discount to normal market prices).

In a recent study, 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.⁹¹ 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.

⁸⁹ Figures for total passenger-kilometers performed in 1996 are taken from the 1997 *Annual Report on Civil Aviation*. Int'l Civil Aviation Org, *Annual Report on Civil Aviation*, 52 INT'L CIVIL AVIATION ORG. J. 1, 5 (1997).

⁹⁰ In view of the wide transaction cost range varying by market, efficiency in use of legal resources, complexity of transaction structures and lack of reliable data, specific estimates of cost savings would be speculative.

⁹¹ See Todd C. Pulvino, *Do Asset Fire-Sales Exist?: An Empirical Investigation of Commercial Airline Transactions* (1996) (Working Paper on file with the Department of Finance, Northwestern University).

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 ten-year asset-backed bond issued to finance the purchase of an aircraft. The cost of the aircraft is assumed to be \$100,000,000 and the airline contributes an equity stake of 10% (i.e., banks or bondholders provide \$90,000,000 in debt financing). Under a no-default scenario, the bondholders would expect to receive twenty semi-annual payments of coupon interest amounting to \$4,500,000 and a final payment of \$90,000,000 (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 \$90,000,000 lent by the banks or bondholders of 13.59%.

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 thirty months, two and a half years, for the bondholders trustee to legally seize possession of the aircraft and sell it at its market value (assumed to be \$90,000,000 for simplicity). That is, the aircraft is finally sold in year ten for \$90,000,000 (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 coupon interest payments (and the lost reinvestment income on those interest payments) during the thirty month period.

By comparison, if the specific expedited relief rule contained in the Convention/Aircraft Protocol were in force in this hypothetical case and the aircraft could be legally seized and sold immediately (e.g., at the beginning of the eighth year for \$90,000,000) 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%.

In this example of a (thirty 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).

6.3. *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, may potentially enable airlines to obtain greater control over fleet planning, by shifting deployment of assets through leases, sub-leases, and asset transfers, in effect, rendering assets and airline fleets more liquid.⁹² In broad terms, the Convention/Aircraft Protocol, through its internationally standardized provisions embodying the asset-based financing principles, may contribute to such market enlargement, cost reductions, 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.

7. MACROECONOMIC GAINS

In addition to the microeconomic benefits enumerated above, there are significant macroeconomic gains associated with the 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,

⁹² A similar benefit of these legal instruments to the airlines 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.

and levels of internal and external public-sector and private-sector debt.

Macroeconomic gains are much more difficult to pinpoint than are 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, and 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 lies well beyond the scope of this study, 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, for example, 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 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.

7.1. *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 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 other 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 generally 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.

7.2. *Trade, Investment, and Multiplier-Effects*

Subsidiary measures of macroeconomic gains, important insofar as they are determinants of the other gains outlined in this Section 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. This 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.

7.3. *Employment Effects*

A third measure of the macroeconomic contribution of the Convention/Aircraft Protocol that is closely, but not perfectly, related to the gains discussed previously is employment-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 Convention/Aircraft Protocol. Unfortunately, the precise employment effects depend largely—through the employment/output ratio—on the overall effects on GDP, the measurement of which suffers from the aforementioned difficulties. Even definitive estimates of global airline revenues as a measure of the gross value of industry output are unavailable.

7.4. *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. From 1987 to 1995, for example, the world's airlines obtained direct government subsidies of some \$1.57 billion plus net tax subsidies (e.g., tax-effects of depreciation and operating losses) of \$10.4 billion.⁹³

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 British Airways in the early 1980s.⁹⁴ A number of airline privatizations have occurred or been announced over the last ten years in both developed and developing countries. In some cases, such as Lufthansa, residual government stakes have been sold to the public, completing the privatization process.⁹⁵ In some cases, such as Air France, announced privatizations were initially cancelled with changes of government, although they reconsidered at a later time.⁹⁶

Privatized airlines must be commercially viable, and often require substantial restructuring by the government before the sale or by the new owners afterward, in order to achieve that viability. Besides improved use of labor resources and operational changes, a commercially viable, privatized airline requires access to equipment

⁹³ See *Annual Report on Civil Aviation*, *supra* note 89, at Table 5.

⁹⁴ See Lynton McClain, *British Airways Polishes its Image: Run up to Privatization Costs Airline \$120 Million*, UK NEWS, Sept. 25, 1985, at 11.

⁹⁵ See *World Watch—Europe/Midwest: Lufthansa Prices a Share Offer in a Record Deal*, WALL ST. J., Oct. 13, 1997, at 16.

⁹⁶ For example, Air France recently completed a partial privatization. See *International Briefs: France to Sell 17% Stake in Airline*, N.Y. TIMES, Jan. 1, 1999, at C5.

acquisition and use of finance 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, thus incrementally and, in select circumstances, materially enhancing airline privatization potential.

7.5. *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 governmental sovereign debt outstanding. 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 can be used for other development purposes.

It is clear that, for rapidly-developing countries such as China, Malaysia, and Egypt, aircraft financing amounted to between two to three percent 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 materially positive effect on sovereign debt levels.

7.6. *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 quantitative⁹⁷ and qualitative⁹⁸ dimensions of the labor force, the capital stock, the natural-resource and energy base, and the level of technology.

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, namely 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 hand. This leads to increased levels of economic activity as well as increased rates of economic growth.

8. CONCLUSION

This study has identified the micro and macro economic 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.

⁹⁷ Relevant questions relating to the quantitative dimension include: (1) what determines the size of the labor force in terms of such underlying variables as demographics, migration, labor force participation rates, and hours worked?; (2) what determines the quality of the labor force in terms of investment in human capital?; (3) what are the main determinants of the formation of physical capital and infrastructure, including savings and investment rates and international transfers of real capital?; (4) how do natural resources enter 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?; and (5) 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 research and development?

⁹⁸ 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, corporate restructuring, mergers and acquisitions, and the market for corporate control insofar as it affects (and is effected by) national and international economic performance.

These gains will be widely shared among airlines and manufacturers, their employees, suppliers, shareholders, and customers, as well as the national economies in which they are located.

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