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Commercial Paper Defaults and Rating Transitions, 1972-1995

Summary

This study integrates and updates previous Moody's studies of commercial paper (cp) defaults and rating transitions. The default studies were prompted in part by the dramatic increase in the incidence of cp defaults that began in the late 1980s. The interest in rating transition studies grew in response to the often severe consequences of a short-term debt rating downgrade for investors and issuers alike. This study begins with a qualitative introduction to global commercial paper markets. It then documents both the incidence and severity of commercial paper defaults since 1972. Finally, it discusses some of the consequences and the likelihood of upgrades, downgrades and defaults. Briefly the study reveals that:

- Since 1972, 39 issuers have defaulted on more than \$3.6 billion of rated and unrated publicly offered cp notes in the USCP market, the Euromarket, and the domestic markets of other nations.
- The credit quality of cp issuers is, on average, very high, and issuers whose fundamental credit quality deteriorates are typically forced to exit the market via an "orderly exit" mechanism. This has helped the short-term markets avoid the higher levels of default risk found in the long-term debt markets.
- Higher short-term credit ratings are more stable than lower short-term credit ratings in the sense that they tend to remain unchanged for longer periods of time.
- The estimated risk of default increases as Moody's opinion of the credit quality of the issuer declines. For a 180-day period, these risks are estimated to be 0.00% for Prime-1, 0.03% for Prime-2, 0.17% for Prime-3 and 0.59% for Not Prime.

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Introduction

Commercial paper markets have historically been nearly default-free. However, the general decline in corporate credit quality that began in the first half of the 1980s set the stage for the spate of credit problems and defaults that struck many cp markets beginning in 1987. While the incidence of default has lessened since 1991, default risk has not fallen back to its pre-1987 levels. This report addresses concerns generated by this surge in credit risk.

Moody's intends this research to serve commercial paper market participants in a variety of ways. By providing estimates of the stability of each rating category as well as the risk of default by rating category, it should enhance investors' understanding of Moody's ratings. The report's analyses and summary information are intended to provide deeper understanding of the trends and structure of the market, particularly its credit aspects. Estimates of the risks of rating changes and default as well as the qualitative discussion of defaulted cp recoveries, should help investors use Moody's ratings to quantify and manage credit risk exposure. Finally, this research evaluates Moody's short-term debt rating track record. Moody's ratings are ultimately opinions based upon both quantitative and qualitative analyses. The most direct way to determine whether these opinions have consistently differentiated securities on the basis of credit risk is to examine the historical record.

The first two parts of this report give the background for the main credit discussion. They include a broad description of cp markets worldwide, including outstandings by industry, market and credit quality, and an explanation of Moody's short-term rating symbols. The next two sections examine the default and recovery experience of cp markets worldwide. The fifth and sixth sections detail patterns of Moody's short-term rating revisions. Included are estimates of the risk of upgrade, downgrade and default associated with each of Moody's short-term rating categories and a discussion of the cp market's "orderly exit" mechanism.

Because of cp's lack of disclosure requirements relative to other public securities, detailed data are often difficult or practically impossible to come by. As a result, the information presented here is, in many cases, incomplete.

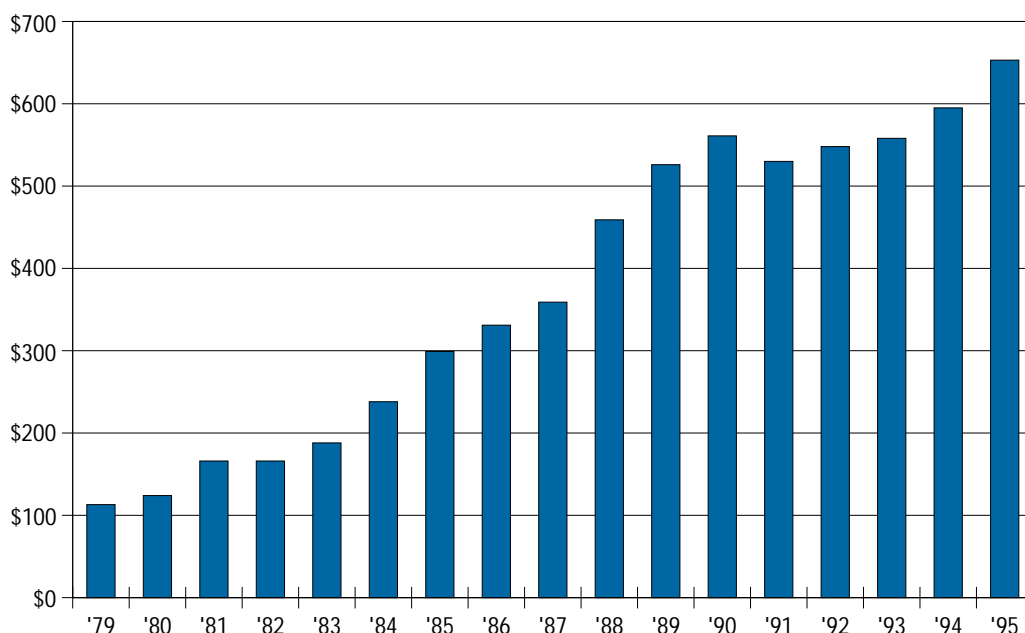
An Overview of Commercial Paper and Commercial Paper Markets

The characteristics of commercial paper vary from one country's market to the next. However, some very general characteristics persist across markets. Typically, cp is a senior level unsecured short-term note. In the United States, cp maturity ranges between one and 270 days. It averages about 45 days. In other countries, the maturities often extend beyond 270 days. Commercial paper is an important, flexible source of short-term financing for the largest and most creditworthy corporations worldwide. The notes generally sell at a discount from par value and may be placed directly by issuers or, more frequently, indirectly through an intermediary. The typically large denominations and relaxed registration requirements (relative to the public bond markets) limit the appeal of cp to retail investors. Consequently, large sophisticated investors dominate the buy-side of the market. Major purchasers of commercial paper include money market mutual funds, corporations, state and local governments, and commercial banks and their trust departments. Secondary market trading is thin in most countries but somewhat more active in many non-U.S. markets, especially Japan.

For issuers, commercial paper serves as a flexible, low-cost alternative to bank loans. Within the parameters outlined in a cp program's prospectus, issuers are generally free to float new paper quickly and cheaply. CP investors, on the other hand, hold funds as cp in anticipation of near-term outlays. As a rule, investors do not consider their cp holdings as risk capital.

Having existed in one form or another for over 200 years, the U.S. commercial paper market is the oldest and largest such market in the world. As recently as the start of the 1980s, just three markets were operating – Australia, Canada and the United States. Despite the emergence and rapid growth of a number of cp markets in the 1980s, the USCP market still accounts for roughly 65% of global cp outstanding. According to U.S. Federal Reserve figures, the USCP outstandings totaled \$649 billion at the end of June 1995. This represents a large 15% increase from the total outstandings of one year before and a sharp increase after nearly 5 years of stagnant volume growth. From 1979 through 1990, cp outstandings grew at a rapid annualized rate of 15.7% per year (see Figure 1). This pace subsequently abated significantly. From 1990 through July 1995, the annualized rate of outstandings growth fell to just 3.4%. At least part of the market's slower growth is attributable to the rapid decline in interest rates in the early 1990s. As long-term rates fell, many firms seized the opportunity to replace

Figure 1 – USCP Outstandings, 1979 – 1995
(\$Billions, year-end levels)

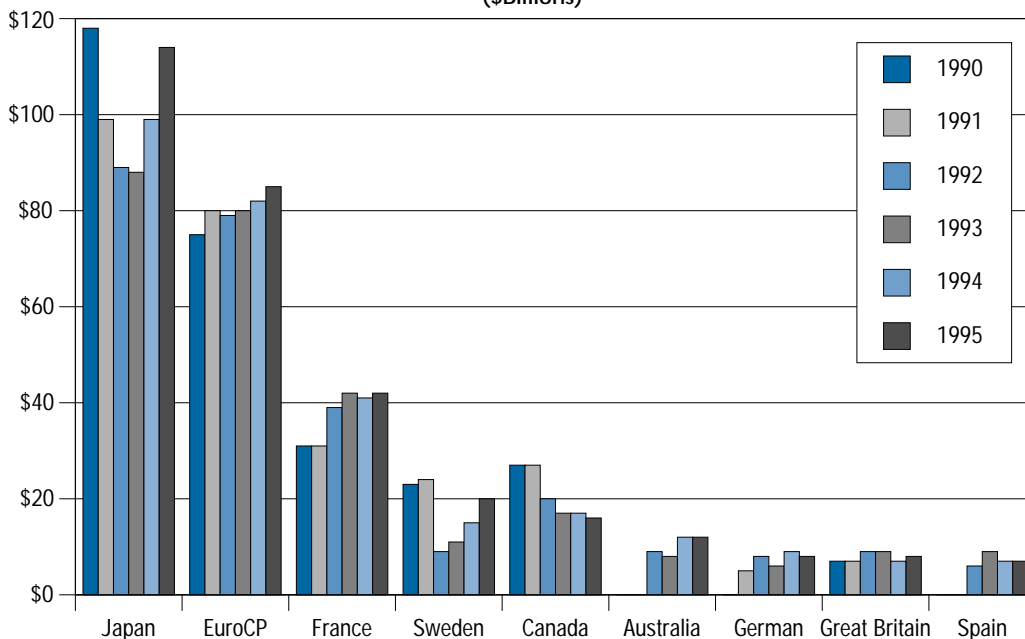


Source: Federal Reserve Bank of New York.

short-term debt with relatively inexpensive long-term bonds, thereby locking in low cost financing.

Since the mid-1980s, there has been a dramatic increase in the volume of commercial paper issued outside the United States. Outstanding volume in the domestic Japanese market, currently the world's second-largest cp market, has grown since its inception in 1987 to a dollar equivalent of \$114 billion as of June 1995 (Figure 2)¹. The Eurocommercial paper market has also surged over the past seven

Figure 2 – Commercial Paper Outstanding in Major Non-U.S. CP Markets²
(\$Billions)



¹ The 1995 data is as of June 1995 for all countries except Sweden and Canada which are as of March and May, 1995 respectively.

² Data received from the Bank of England, Central Bank of Sweden, Sveriges Riksbank and Enskilda Corporate (Sweden), Bank for International Settlements, (EuroCP), Westpac Money Market (Australia), Bundesbank (Germany), Banque de France (France), Comision Nacional del Valores (Spain), Bank of Japan (Japan), Bank of Canada Review (Canada).

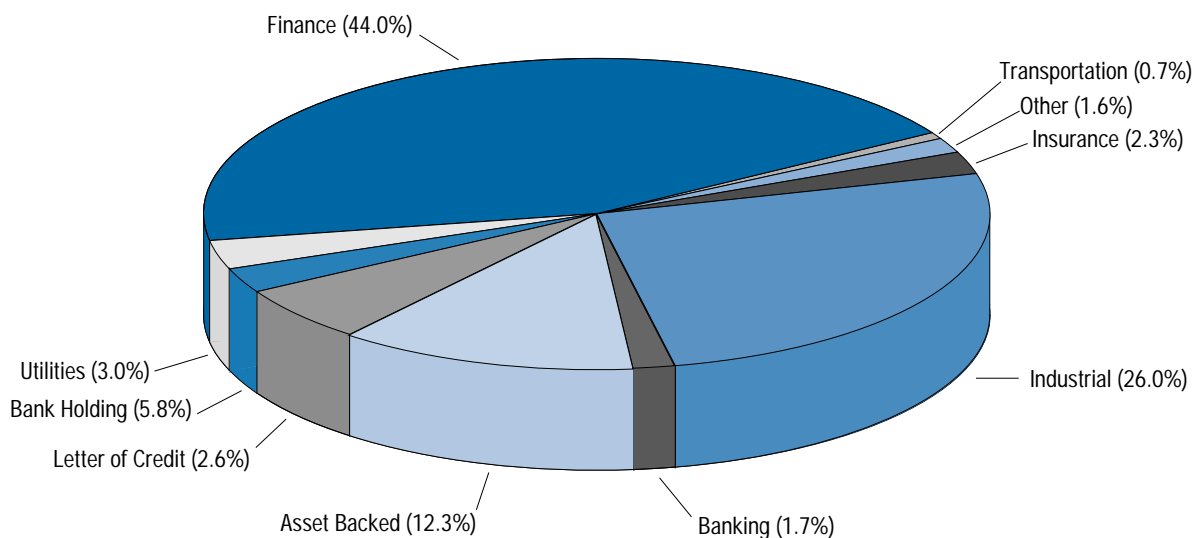
years from \$15 billion at the end of 1986 to \$85 billion as of June 1995. Over the same period, the domestic French cp market grew from \$5 billion to \$42 billion.

CP outstandings tend to vary with credit market conditions. For example, Canadian commercial paper outstandings have decreased gradually since 1991, reflecting, in part, that country's protracted economic slowdown. On the other hand, Sweden's commercial paper outstandings dropped steeply in 1991 at the height of that market's credit difficulties, but have since risen back to pre-1991 levels. Japanese cp outstandings followed a similar pattern. They dropped to \$93 billion in 1993 and have since rebounded to \$114 billion as of June 1995. The low between 1992 and 1994 reflects a period of political uncertainty and economic fragility. The nine commercial paper markets represented in Figure 2 together with the USCP market totaled an estimated \$949 billion as of June 1995.

Based on Moody's rated population as of June 30, 1995, which represented over 93% of USCP outstandings, the two sectors supplying the largest fractions of commercial paper were financial institutions (excluding depository institutions and structured entities), 44%, and industrial firms, 26%, (see Figure 3). Filling in the third and fourth spots were the asset-backed and bank holding company categories with 12% and 6% respectively. Utilities (3%), letter of credit-backed (3%), insurance companies (2%), banks (2%), miscellaneous other entities (2%), and transportation companies (1%) issued the remaining commercial paper.

Figure 3 – Rated U.S. Commercial Paper by Sector

(as of June 30, 1995)



Moody's Short-Term Rating System

Moody's short-term ratings (Prime-1, Prime-2, Prime-3, and Not Prime) represent Moody's opinion of an issuer's capacity to meet its short-term debt obligations. In contrast to Moody's long-term debt ratings, which address both the likelihood and severity of default, Moody's short-term ratings concentrate on the likelihood of default. In assigning short-term ratings, it is Moody's objective to rate no cp Prime that will default. The Prime-1, Prime-2, and Prime-3 rating categories can be thought of as measures of distance in time from the Not Prime rating decision. An issuer rated Prime-1 typically would have the longest distance in time before a weakening of the company's financial strength would cause it to be rated Not Prime. Prime-2 and Prime-3 issuers typically would have successively shorter time spans before they would become Not Prime.

Figure 4 ranks these ratings from highest to lowest credit quality and provides a rough correspondence between an issuer's short-term rating and the rating on its long-term senior unsecured debt, should such debt exist.

Figure 4 – Short-Term vs. Long-Term Ratings

	Short-Term Rating	Long-Term Sr. Unsecured Rating
Investment-Grade	Prime-1	Aaa
		Aa1
		Aa2 Aa3
	Prime-2	A1
		A2
		A3
	Prime-3	Baa1
		Baa2
		Baa3
Speculative-Grade	Not Prime	Ba1
		Ba2
		Ba3
		B1
		B2
		B3
		Caa
		Ca
		C

Issuers designated as Prime-1 are likely to fall within the long-term rating band that extends from A3 up through Aaa. The band for Prime-2 issuers is somewhat narrower, typically ranging from the low end of Baa2 to the higher end of A2 on the long-term scale. Issuers at the lowest investment-grades for long-term ratings (Baa3 and the low end of Baa2) would, in most cases, be rated Prime-3 for short-term obligations. This correspondence is not as neatly defined for supported cp programs, where the credit strength of a guarantor or of a letter of credit supplements the ability of the cp issuer to fulfill its obligations. The “Not Prime” rating category corresponds to the speculative-grade ratings in the long-term rating system (Ba1 to C). Correspondingly, the “Not Prime” rating is an indication that Moody’s deems the short-term obligation to hold such a high degree of credit risk that the investment would be speculative in nature.

There is a high, though imperfect, correlation between an issuer’s long-term and short-term ratings. While a high long-term debt rating is typically necessary for a cp issuer to obtain a high short-term debt rating, it is not sufficient. High short-term credit quality requires additional protections that address the short-term nature of the contract – specifically, the liquidity concerns it raises. The short maturities of cp notes imply less flexibility and greater urgency in dealing with unexpected new financing needs. Most companies – including highly rated ones – would not be able to repay maturing commercial paper on short notice from their internally generated cash. Hence, in assessing short-term credit quality, a critical concern relates to how a company would repay maturing cp if, perhaps due to market turbulence, a decline in credit quality, or investor reluctance to reinvest, it were unable to roll it over. To address this potential problem, the analysis places a great deal of weight on the company’s liquidity and its access to alternative sources of liquidity. Typical characteristics of highly rated short-term issuers are large size, backup liquidity provisions, high and stable earnings, and large stocks of liquid assets.

Moody’s began assigning short-term ratings in 1971. Since then, Moody’s has rated over 4,100

commercial programs issued by over 3,770 issuers worldwide. As of January 1995, Moody's had public ratings on 1,991 cp programs globally (see Table 1). These programs account for \$577 billion (96%) of the \$600 billion of outstanding taxable cp then outstanding in the U.S., and an estimated 74% of the \$82 billion of outstanding EuroCP.

Table 1 – CP Program Counts by Moody's Rating Category (as of January 1)

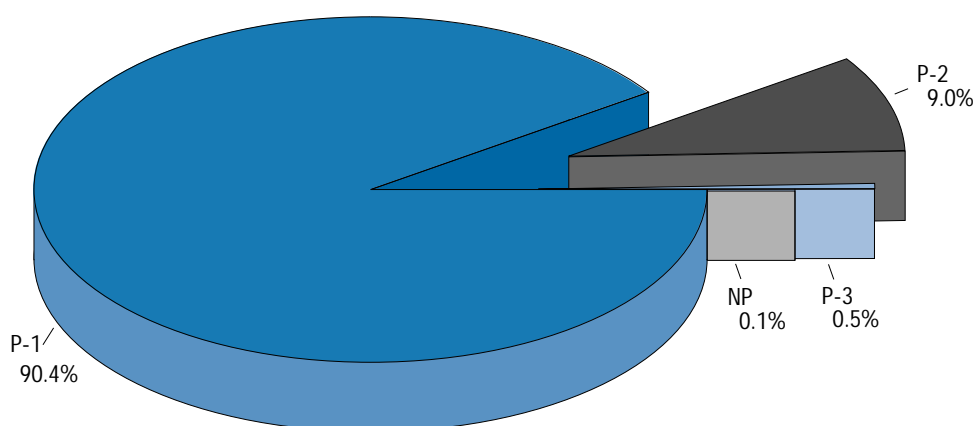
	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
P-1	311	327	309	313	354	384	423	519	596	659	768	886
P-2	189	220	199	180	172	157	161	175	176	178	197	181
P-3	34	37	19	14	11	11	11	10	14	13	18	18
NP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5	1
Total	534	584	527	507	537	552	595	704	786	850	988	1,086

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
P-1	971	1,003	1,004	1,076	1,203	1,287	1,334	1,392	1,411	1,408	1,520
P-2	197	219	216	209	228	237	253	264	330	399	380
P-3	16	15	28	18	32	37	48	46	47	48	44
NP	1	12	16	16	14	47	58	61	59	50	47
Total	1,185	1,249	1,264	1,319	1,477	1,608	1,693	1,763	1,847	1,905	1,991

The role independent credit quality ratings played in cp markets escalated sharply following Penn Central Railroad's 1970 default on long-term debt and cp.³ A rash of defaults in the late 1980s and certain regulations have combined to further increase rating coverage. Specifically, the February 1991 passage of certain amendments to the SEC's rule 2a-7 put restrictions on exposure of money market mutual funds to lesser-grade cp. Today nearly all U.S. programs carry a rating by one of the major agencies.

Although Moody's has four rating categories for commercial paper, most of the rated global cp market falls in the Prime-1 category. Of the \$689 billion of Moody's-rated cp outstanding at the end of June 1995, 90%, or \$623 billion, held the highest rating (see Figure 5). CP rated in the second-highest rating category, Prime-2, accounted for 9%, or \$62 billion of the total. The Prime-3 rating applied to just 0.48%, or \$3 billion, of globally rated cp. And cp rated Not Prime represented a mere 0.05%, or \$310 million of rated cp.

Figure 5 – Global Commercial Paper Outstanding by Moody's Rating
(as of June 30, 1995, US\$689 Billion = 100%)



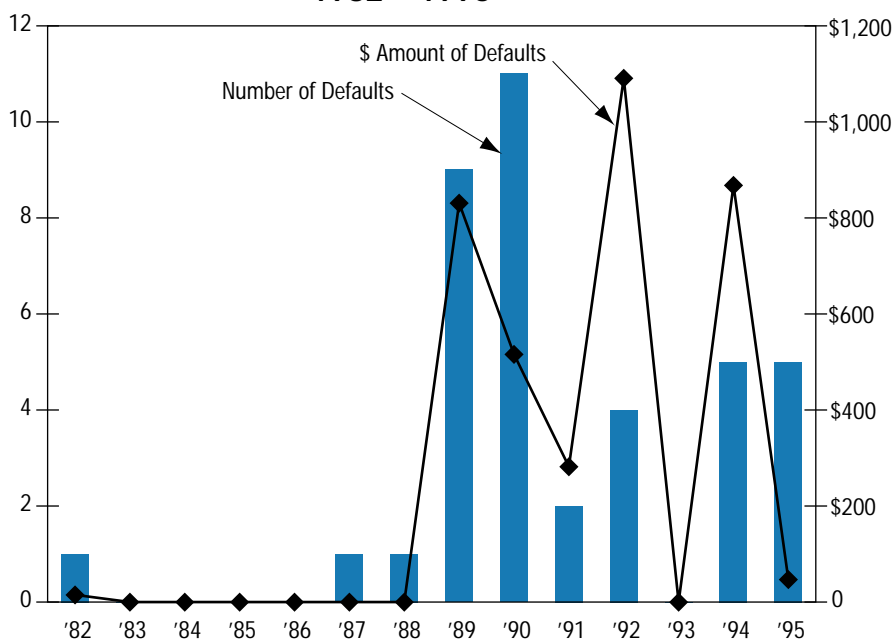
³Penn Central's cp was rated by National Credit Office, a subsidiary of Dun & Bradstreet.

Commercial Paper Defaults

We define a commercial paper default as any delayed or foregone disbursement of principal or interest (in those rare cases where cp takes the form of an interest bearing note). This definition includes forced rollovers and delayed payments – even when they are allowed for under the terms of the notes. While conservative, we believe this definition to be the one most appropriate for commercial paper investors.

Using this definition of default, our research has uncovered 39 issuers that have defaulted on at least \$3.6 billion of cp since 1972. Figure 6 details the incidence and dollar volume of defaulted cp in each of the past 14 years.

Figure 6 – Yearly Number and Dollar Amount of Commercial Paper Defaults, 1982 – 1995



Between 1972 and 1987, there had been only one default by a cp issuer. The issuer, Manville, defaulted on \$15 million of cp or approximately 0.01% of the \$166 billion of USCP outstanding in 1982. The incidence of default began to rise in 1987 and 1988 with the defaults of SFEC in the domestic French cp market and FECSA in Spain's domestic cp market. CP markets were then rocked by a spate of defaults in the following two years. Nine issuers defaulted on at least \$831 million in 1989 and 11 issuers defaulted on at least \$517 million more cp in 1990. While 1989 and 1990 produced the greatest number of programs and dollar amounts of defaulted cp since 1972, still only 0.11% and 0.06% of the dollar amount of cp outstanding globally defaulted in these years respectively. 1989's defaults mainly hit the larger U.S. and Euro commercial paper markets. The turmoil in the USCP market extended into 1990 when there was also a slew of five defaults in the domestic Swedish cp market.

Since 1990, the pace of default has slowed, although remained well above its pre-1989 levels. Defaults continued in the U.S. and Swedish markets over the following two years but the largest default of this period (also the largest on record since 1972) occurred in the domestic Canadian market. In 1992, Olympia and York, the Canadian real estate giant, defaulted on \$614 million of cp.

Since 1994, cp markets have witnessed an additional 10 companies default on a total of \$915 million of commercial paper: \$868 million in 1994 and \$47 million in 1995 (see the appendix for details of these defaults). All of the defaulters were based outside of the U.S. and none of the defaulted commercial paper was issued in the U.S. (eight out of the 10 programs were Eurocommercial paper). The industrial sector represented eight out of the 10 defaults and 60% of the total dollar amount. The financial industry accounted for the balance of the default activity.

All of 1995's defaults were directly or indirectly related to the devaluation of the Mexican peso. Four of the five defaulters were Mexican companies that suddenly faced increased effective amounts of debt because of the Mexican Peso's devaluation. The fifth, an Argentinean paper company, Alto Parana, defaulted as a direct result of the turbulence generated by Mexico's currency devaluation.

There are several related reasons for the surge in cp defaults globally between 1989 and mid-1992. During the general bull market of the late 1980s, increasing numbers of investors were willing to accept higher risk in exchange for higher yield. Many assumed that even lower quality issuers would be able to meet short-term obligations because they would have continued access to a market apparently awash in credit. Active promotion of lower quality credits by some dealers as well as an assumption that market intermediaries (such as Drexel Burnham Lambert, Inc.) would provide liquidity support under stress characterized this bull market. In addition, the expansion of cp markets in the U.S. and globally opened the way for many new and often inexperienced players to enter the markets, contributing to unrealistic expectations and imprudent credit practices.

The rapid increase in the number and volume of low-investment-grade and “junk” cp in this period attests to a loosening of credit approval standards by many cp investors. As a result, more default-prone issuers were allowed to enter the market. Easier credit standards most likely weakened the “orderly exit” mechanism (see the section by that title) of cp markets. As a result, riskier issuers’ exits were delayed, allowing an abnormally high amount of credit risk to linger in the market.

Also, as liquidity in the credit markets tightened in mid-1989, some commercial banks proved less willing and able to fulfill their traditional role as backup sources of liquidity to cp issuers under stress. In all cases of a rated cp default, except the strategic voluntary bankruptcy filings of Manville and Columbia Gas System, the proximate cause of default was a failure of the issuer’s banks to provide sufficient funds to meet cp obligations as other lenders pulled back. For example, when Wang faced a general market perception that the firm’s financial condition was weakening and its line banks failed to reach agreement on support for the firm, it could not raise enough cash to redeem its maturing ECP.

Finally, the forces of securitization and globalization have tended to weaken the reliability and predictability of backup liquidity for cp. The trend towards asset securitization has led to disintermediation and has eroded the banks’ market position. Furthermore, banking relationships have weakened as borrowers have become more transaction-oriented and less dependent on the commercial banking industry. For example, banks are now more willing to invoke “material adverse change” clauses, as relationship banking yields to transaction banking.

Moody’s-Rated CP Defaults

Since 1972, 10 issuers that held a Moody’s rating have defaulted on cp. Table 2 lists these issuers along with details of their defaults and ratings before default. The first default occurred when Manville Corporation strategically entered Chapter 11 bankruptcy proceedings on August 26, 1982. Manville sought protection from creditors while technically solvent in a bid to protect its assets from potentially unlimited liabilities incurred in product liability suits concerning the firm’s manufacture of asbestos. On the date of the filing, the company had about \$15 million of USCP outstanding, all with an original maturity well under three months. Moody’s had downgraded the company to Prime-2 94 days earlier.

Colorado-Ute Electric Association defaulted on \$19 million of USCP on August 17, 1989. Low demand and excess capacity conspired with the firm’s inability to raise electricity rates to create serious liquidity problems. Four months earlier on April 3, Moody’s lowered the company’s short-term debt rating from Prime-1 to Not Prime when Moody’s learned of the firm’s default on a loan from a government agency. Nevertheless, Moody’s believes that the entire \$19 million of outstanding cp had a Prime-1 rating at issuance.

Next, Equitable Lomas Leasing Corp. (a separate legal entity from Lomas Financial) defaulted on \$53 million of USCP on September 12, 1989, while rated Not Prime. However, between 91 and 15 days before default, the company was rated Prime-3, and was under review for downgrade. Moody’s believes that a portion of the defaulting commercial paper was purchased during the period in which the issuer was still rated Prime-3. However, because of a general perception of the issuer’s mounting difficulties, reinforced by the risk implied by the rating review, most investors had scaled back their exposure so that relatively little cp with an original-issue rating of Prime-3 defaulted.

Columbia Gas Systems defaulted on \$268 million of USCP on June 20, 1991. The day before the default, Moody’s lowered the rating on the company’s cp from Prime-2 to Not Prime. In July 1991, Columbia Gas filed for Chapter 11 bankruptcy protection, citing possible losses from natural gas purchase contracts.

UNI Storebrand A/S was seized by regulators on August 25, 1992, on the heels of severe losses on its investment in Skandia Group Insurance Co. Ltd. of Sweden. The firm thus defaulted on an estimat-

Table 2 – Rated CP Defaults, 1972 – 1995

Defaulter	Date of Default	Market	Vol. of Defaulted Notes (\$million)	Rating at Default	Ratings Before Default										Original Rating on Earliest Outstanding
					30 Days	60 Days	90 Days	120 Days	180 Days	270 Days	1 Year				
Manville Corp.	8/26/82	USCP	15.2	P-2	P-2	P-2	P-2	P-1	P-1	P-1	P-1	P-1	P-1	P-1	P-2
Wang Credit Corporation	8/16/89	ECP	100.0	NP	NP	NP	NP	NP	NP	P-3	P-3	P-3	P-3	P-3	NP
Wang Laboratories Inc.	8/16/89	ECP	96.0	NP	NP	NP	NP	NP	NP	P-3	P-3	P-3	P-3	P-3	NP
Colorado-Ute Financial Service Corp.	8/17/89	USCP	19.0	NP	NP	NP	NP	NP	P-1	P-1	P-1	P-1	P-1	P-1	NP
Lomas Financial Corp.	9/1/89	ECP	17.3	NP	NP	NP	NP	P-3	P-3	P-3	P-3	P-3	P-3	P-3	NP
Equitable Lomas Leasing Corp.	9/12/89	USCP	53.0	NP	P-3	P-3	P-3	P-2	P-2	P-2	P-2	P-2	P-2	P-2	P-3
Columbia Gas System Inc.	6/20/91	USCP	268.0	NP	P-2	P-2	P-2	P-2	P-2	P-2	P-2	P-2	P-2	P-2	P-2
UNI Storebrand	8/25/92	ECP	10.0	NP	P-3	P-2	P-2	P-2	P-2	P-2	P-2	P-2	P-2	P-2	P-2
Metallgesellschaft Aktiengesellschaft	1/7/94	DMCP	292.8	NP	P-2	P-2	P-2	P-2	P-2	P-2	P-2	P-2	P-2	P-2	P-2
Metallgesellschaft Finance B.V.	1/7/94	ECP	200.0	NP	P-2	P-2	P-2	P-2	P-2	P-2	P-2	P-2	P-2	P-2	P-2

ed \$10 million of Eurocommercial paper and a substantially larger amount of unrated domestic Norwegian cp (see also Table 3 below). The ECP program had been rated Prime-2 since December 8, 1988. On July 20, 1992, it was downgraded to Prime-3 and then to Not Prime on August 21, 1992.

Three issuers, Wang Laboratories, Wang Credit Corporation and Lomas Financial Corp., defaulted on cp rated Not Prime by Moody's at issuance. All three issuers were downgraded to Not Prime from Prime-3 at least two months before defaulting; investors, who typically buy commercial paper from issuers of weak credit quality only at short maturities, in these cases bought no Prime-3 cp with maturities longer than two months. Therefore, the total of \$213 million of defaulted cp affected only those investors who purchased cp notes rated Not Prime.

In 1994, Metallgesellschaft Aktiengesellschaft and Metallgesellschaft Finance B.V. together defaulted on DM834 million (US\$479.6 million) of commercial paper. Metallgesellschaft Aktiengesellschaft's program was issued in the Eurocommercial market and Metallgesellschaft Finance B.V.'s program was issued in the domestic German market. The companies delayed payment on cp maturing on January 7, 1994, for a short while after reporting a loss of DM1.87 billion (US\$1.07 billion) for the 1993 fiscal year due to trading losses. Moody's believes that all of the cp outstanding on January 7, 1994 had an original rating of Prime-2.

Defaults on CP Not Rated by Moody's

In this subsection we consider cp defaults by issuers that did not carry a Moody's short-term rating. Table 3 lists 30 such defaults spread throughout the U.S., Euro, British, Canadian, Norwegian, Finnish, Swedish, Spanish and French markets. For many of the defaults, the volume of defaulting cp is unavailable (the appendix contains greater detail for defaults that have occurred since 1994).

Table 3 – Unrated CP Defaults, 1972-1995

Defaulter	Default Date	Market	Volume of Defaulting Notes (US\$mil.)
Aerovias De Mexico S.A. de C.V.	3/14/95	ECP	25.0
Beijer Capital AB	1990	Swedish	
Bensow	1989	Finnish	
Codec	4/1/90	French	66.0
Confederation Life Insurance Company	8/11/94	Canadian	147.3
Confederation Treasury Services U.K. Ltd.	8/11/94	ECP	203.15
Corporacion Intra	2/91	Spanish	14
DFC New Zealand Ltd.	10/3/89	ECP	270.0
Drexel Burnham Lambert Group Inc.	2/13/90	USCP/ECP	125.0/30.5
FECSA	1988	Spanish	
Finansor AB	1990	Swedish	
Gamelstaden Förvaltnings AB	1990	Swedish	
Gota AB	9/16/92	Swedish	184
Grupo Simec, S.A. de C.V.	2/15/95	ECP	10.0
Grupo Situr, S.A. de C.V.	2/15/95	ECP	5.0
Grupo Synkro S.A. de C.V.	11/11/95	ECP	17.0
Haningeheim AB	1992	Swedish	
Infina/Independent AB	1990	Swedish	
Integrated Resources Inc.*	6/15/89	USCP/ECP	213.0/63.0
Kapital Haus	2/14/95	ECP	4.50
Mancon	1989	Finnish	
Mortgage & Realty Trust	3/15/90	USCP	166.9
Nyckeln Holding AB	1990	Swedish	
Olympia & York	3/11/92	Canadian	614
Polly Peck Int'l plc*	10/05/90	Sterling CP	90.6
SFEC	1987	French	
Stotler Group	7/25/90	USCP	0.75
UNI Storebrand	8/25/92	Norwegian	288
Washington Bancorp	5/11/90	USCP	36.7
Zanella Hermanos y Cia.	2/13/95	ECP	10.5

*Both of these firms carried speculative-grade long-term debt ratings.

Table 3 lists the defaults of two cp issuers with Moody's speculative-grade, long-term bond ratings, but without Moody's short-term ratings. Integrated Resources Inc. defaulted on an estimated \$276 million of cp on June 15, 1989, affecting investors in both the USCP and ECP markets. Although the commercial paper was not rated by Moody's, there had been a speculative-grade rating on the long-term debt for over 10 years prior to default. The speculative-grade rating on the senior unsecured long-term debt would imply that, if rated, the company would have carried the Not Prime designation for its commercial paper. Similarly, the long-term debt rating of Polly Peck International plc, which defaulted on cp in the sterling market, had been speculative-grade ever since its initial rating some eight months before the cp default.

The largest default to date is that of the troubled Canadian real estate developer Olympia & York. It occurred in 1992 and affected the U.S. dollar equivalent of \$614 million. O&Y, the giant real estate conglomerate owned by the Reichmann family, announced in March 1992 that it would have to restructure some \$12 billion in debt. Like many other real estate developers, O&Y suffered from the general worldwide decline in real estate prices following more than a decade of overbuilding and speculation. On May 14, 1992, the company filed for bankruptcy protection under the Canadian Companies' Creditors Arrangement Act.

Table 3 highlights the credit risk in newly developed cp markets. While all non-U.S. markets are relatively small, they have contributed the lion's share of unrated cp defaults. Of special note is the frequency with which issuers defaulted in the domestic Swedish cp market in the early 1990s. Market deregulation in Sweden had led to increased competition between domestic finance houses. Five highly leveraged houses defaulted; two of them, Nyckeln Finans and Beijer Capital AB, were liquidated with investors suffering losses.

The discussions of rated and unrated defaults above cover the incidence of default, important to any understanding of the credit risks cp investors face. However, the event of default is usually only the first stage in a long process that, in the end, generates a settlement between the issuer and the investors. Of critical interest to investors is the loss they can expect to incur if holding cp notes that default. The next section addresses this topic.

Recovery Survey of Defaulted Commercial Paper

Once in default, commercial paper investors are typically grouped with other unsecured creditors in payment priority, that is, behind holders of secured debt, but ahead of junior creditors such as holders of subordinated debt. However, while Moody's long-term debt default research indicates that senior unsecured bond investors can expect to recover about 45% of the accrued principal and interest of a defaulted bond, the recovery experience of many cp investors has been much better. Table 4 qualitatively summarizes the recovery experience of 13 cp defaults for which we have reliable information.

Table 4 – Recovery Survey for CP Defaults

Company Name	Default Date	Recovery Description
Manville Corp.	8/26/82	In November 1988, investors received securities and cash reflecting principal and accrued interest.
Wang Credit Corporation	8/16/89	Principal and interest repaid within grace period.
Wang Laboratories Inc.	8/16/89	Principal and interest repaid within grace period.
Colorado-Ute Financial Service Corp.	8/17/89	Investors were paid back principal by December 1992 and most of the interest by early 1993.
Lomas Financial Corp.	9/1/89	In January 1992, cp investors received cash and securities amounting to approximately 75% of their claim.
Equitable Lomas Leasing Corp.	9/12/89	Made interest payments until 4/30/90 when notes were fully repaid.
UNI Storebrand A/S	8/25/92	Investors received interest and principal in cash by August 1993.
Columbia Gas System, Inc.	6/20/91	On November 28, 1995, investors received interest and principal due, together with interest on interest at a rate of LIBOR + 2%. Paid partly in cash and partly in new securities.
Metallgesellschaft Aktiengesellschaft	1/7/94	Investors received principal back in less than one month after default.
Metallgesellschaft Finance B.V.	1/7/94	Investors received principal back in less than one month after default.
Grupo Simec S.A. de C.V.	3/15/95	Investors received principal back two days after default.
Grupo Situr S.A. de C.V.	3/15/95	Investors received principal back two days after default.
Kapital Haus S.A. de C.V.	3/14/95	Investors received principal back three days after default.

In each of the defaults listed above except for that of Lomas Financial Corp., cp holders received full payment of principal though, in some cases, after a delay. In cases where the payment delay was significant and an appreciable amount of interest had accrued, interest was also returned in full. Hence, losses to investors in each of these cases were generally near-zero and amounted to the inconvenience of payment delays (sometimes substantial) and occasional non-cash payments. In the default of Lomas Financial Corp., on the other hand, cp holders' claims were significantly impaired. After more than two years of delay, investors in Lomas' \$17.3 million of cp that defaulted were awarded a package of cash and securities amounting to only about 75% of their claim. It is interesting to note that none of the seven defaults that involved cp rated Prime by Moody's at issuance, generated any appreciable losses to investors.

If the recovery experience detailed in Table 4 is representative of broader cp recoveries, one must ask why cp, if it is classified as a senior unsecured claim along with longer-term notes and debentures, has had such a favorable recovery experience? In those cases where the cp defaulter simultaneously defaulted on long-term bonds of similar seniority, it is likely that the severity of loss to bondholders

was also small. This was certainly the case for Manville bond investors, who received principal and interest and the interest on the interest, albeit after a five-year delay. Also, the resolution of Columbia Gas System's bankruptcy extended a near-zero loss to senior unsecured bond holders as well. In the one case listed above where cp investors suffered significant losses (the default of Lomas Financial Corp.) bondholders suffered losses of approximately the same amount.

While this is certainly not an exhaustive analysis of recoveries, it is suggestive. CP defaults are typically of very mild severity because of the nature of the cp market and the types of credit scenarios that typically lead a cp issuer to default. For a variety of reasons, ranging from the structure of certain market regulations to the prudent investor credit approval processes to investors' demand for a near-money asset, cp markets are extremely risk averse. Access to the market for issuers is predicated upon very high fundamental credit quality and liquidity. Because of the sound fundamental credit quality of most cp issuers, defaults in this market tend to be mild. The most likely default scenario for cp issuers is that of a liquidity crisis. In this case, the issuer is called upon to redeem an unforeseen quantity of maturing paper. Because of the issuer's sound fundamentals, additional credit can be found and the cp investors paid off, though perhaps after a delay.

A deterioration in fundamental credit quality is typically discernible well in advance of actual default. CP investors perceive this and refuse to roll over the issuer's paper. This generates an "orderly exit" mechanism – the subject of the next section.

The USCP Market's "Orderly Exit" Mechanism

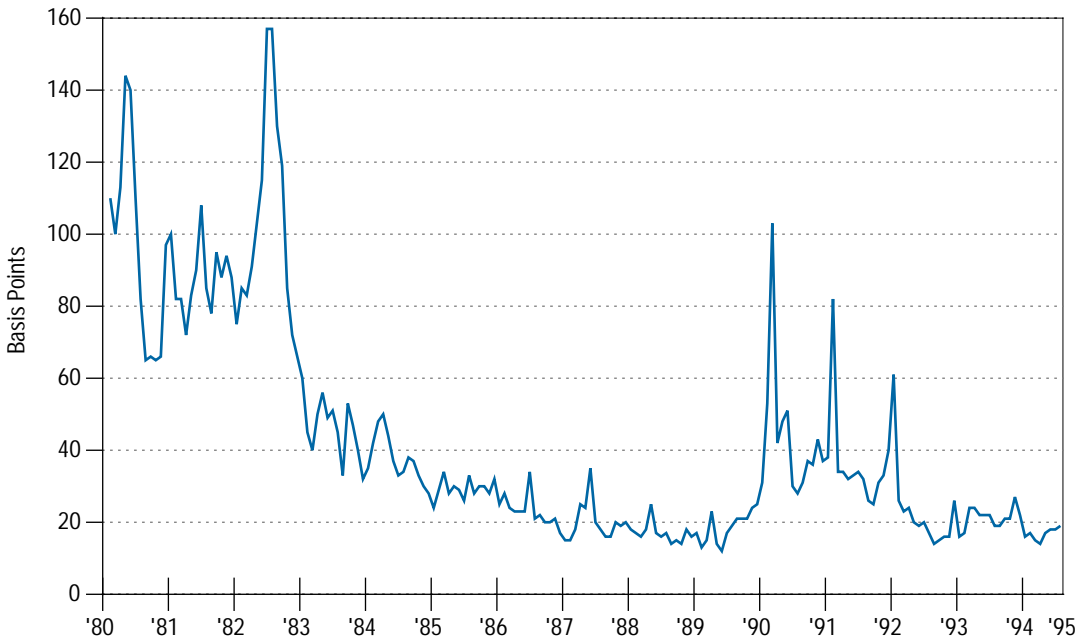
Periodic (though rare) defaults, the regulatory environment, a high degree of investor risk aversion, a shallow secondary market, and short maturities have created a quantity rationing or "orderly exit" mechanism in the USCP market. That is, a weakening of an issuer's credit is typically accompanied by a refusal by investors to roll over maturing cp. In this way, the market compels the issuing firm to reduce or eliminate its cp financing. This process usually begins long before access to alternative forms of liquidity, such as bank lines, are denied to a company. Firms in this situation must replace the maturing cp with an alternative and presumably less convenient form of financing that is more consistent with a low investment-grade or a speculative-grade credit quality. This mechanism is well-developed in the USCP market and is developing in other cp markets.

A variety of influences contribute to the market's orderly exit mechanism. Most cp investors desire a near-money asset and therefore have a very low tolerance for any type of risk. The short maturities (and correspondingly low durations) and the exceptionally high credit quality of cp issuers shields investors against both interest rate and credit risk. Also supporting the orderly exit mechanism in the U.S. are certain regulations. SEC rule 2a-7, for example, limits the amount of cp rated below Prime-1 that a money market fund can carry. This regulation effectively truncates demand for riskier cp by eliminating a large pool of potential cp investors from eligibility. Additionally, the lack of a deep secondary market limits the attractiveness of cp as a credit arbitrage instrument. The spreads over risk-free debt are not large and the secondary market's illiquidity renders active credit risk management difficult.⁴

One indicator of the relative importance of the quantity adjustment and price adjustment processes in the USCP market is the almost imperceptible movement in credit spreads during the 1989-1991 turmoil. This period saw one of the largest waves of commercial paper issuer defaults in history. Despite this, price differentials, as represented by the spread between Prime-2 and Prime-1 cp (see Figure 7), barely budged to an average 29 basis points from the 22 basis point average of the 1986 to 1988 period. More pronounced in recent years are seasonal peaks in this spread. These peaks are due in part to year-end "window dressing" activity.

⁴The secondary market for directly placed cp may even be less liquid. In this case, the only potential buyer may be the issuing firm. In a time of heightened credit risk, when risk averse cp issuers would most desire to off-load risky cp, the issuer is unlikely to be in a position to buy back the notes. Even in the case of intermediated cp, dealers, the primary players in the secondary market, most likely will only buy back cp under "normal" market conditions.

Figure 7 – Yield Spread Between Prime-2 and Prime-1 Commercial Paper



Source: Board of Governors of the Federal Reserve System

One way to assess the effect of the orderly exit process is to note the systematic change in the volume of outstanding paper associated with rating downgrades. To measure this effect, we first adjusted uscp amounts outstanding from 1978 (the first year for which outstandings data were available) through November 1995, for inflation as measured by the consumer’s price index. This effectively restated the amounts outstanding in terms of 1983 dollars and allowed us to directly compare amounts outstanding from different years. We then determined the adjusted amounts of cp outstanding for each cp program for the quarters preceding and following a downgrade. Finally, we totaled all the quarter-preceding and quarter-following adjusted amounts outstanding according to the type of the downgrade. The percentage change in these totals is an indication of the size and direction of the effect on outstandings of a rating revision. Table 5 presents the results of this analysis.

Table 5 – Change in USCP Outstandings Associated with Rating Changes

	Amt. Outstanding Before Rating Change (Bill. 1983 dollars)	Amt. Outstanding After Rating Change (Bill. 1983 dollars)	Percentage Change in CP Outstanding
P1 → P2	\$179.6	\$161.9	-9.9%
P2 → P3	\$50.8	\$33.4	-34.4%
P3 → NP	\$10.4	\$4.96	-52.4%

On average, for a USCP issuer downgraded from Prime-1 to Prime-2, outstandings fell by 10%. Moreover, the rate of decline increases with successive downgrades. A transition from Prime-2 to Prime-3 has typically been associated with a 34% decline in outstandings and a transition from Prime-3 to Not Prime has typically been accompanied by a 52% decline in outstandings. This provides additional evidence in favor of the orderly exit mechanism.

Table 5 suggests a pattern of cp issuers being forced from the cp market as their credit quality deteriorates. Our research has also uncovered 43 issuers that defaulted on long-term bonds after having exited the cp market. Table 6 lists these companies along with the number of months before default that the issuer received the Prime-3 and Not Prime ratings, as well as the number of months before default that Moody’s withdrew the rating (“WR”). The Not Prime rating or withdrawal of a rating can be taken as a rough indicator of the date at which the issuer had either exited the market or was about to exit the market as current outstandings matured. Accordingly, these issuers exited the cp

markets an average of 39 months – over three years before defaulting on their long-term debt.

The “orderly exit” mechanism and investors’ risk aversion assure that outright defaults in the commercial paper markets are rare relative to the long-term debt markets. But this risk aversion, while helping cp markets avoid defaults, creates serious consequences for changes in credit quality of smaller magnitude than actual default. The next section concerns various aspects of these changes in credit quality as measured by rating transitions.

Table 6 – Issuers Defaulting on Long-Term Debt After Exiting CP Market

Defaulter	Long-Term Default Date	Time from CP Rating to Default (months)		WR or No CP Outstanding
		P-3	NP	
Baldwin (D.H.) Co.	9/26/83	135.4	N/A	67.7
Bank of New England	1/7/91	15.2	12.8	0
Banks of Mid America, Inc.	10/15/88	40.3	32.1	N/A
Carter Hawley Hale	2/11/91	N/A	N/A	231.2
Chase Manhattan Mortgage & Realty Trust	6/29/76	N/A	N/A	20.2
Chrysler Credit Canada Ltd.*	1/6/80	9.0	N/A	5.3
Chrysler Financial Corporation*	1/6/80	9.0	N/A	5.3
Continental Mortgage Investors	10/29/74	N/A	N/A	4.9
DFC New Zealand Inc.	10/3/89	2.5	0.1	N/A
Dow Corning Corporation	5/15/95	N/A	5.06	N/A
Federated Department Stores	1/15/90	N/A	22.3	21.0
Fidelity Mortgage Investors	1/15/75	16.1	N/A	14.5
First City Bancorporation of Texas	9/9/87	19.9	16.8	N/A
First City/Scovill	5/15/91	191.6	N/A	104.6
First Mortgage Investors	4/15/75	N/A	N/A	12.6
First RepublicBank Corporation	3/15/88	N/A	11.3	N/A
Fruehauf Corporation	1/15/89	74.6	N/A	27.2
Glendale Federal Bank	3/10/93	62.0	40.2	N/A
Gordon Jewelry	12/1/91	74.4	N/A	73.4
HNC Mortgage and Realty	11/1/75	27.8	N/A	20.4
Insilco	1/14/91	37.3	28.9	23.0
Interco, Inc.	5/10/90	N/A	N/A	17.6
International Harvester Credit Corporation	2/8/83	26.9	N/A	24.5
Maxwell Communications Corporation plc	12/16/91	N/A	10.0	N/A
MCorp	10/21/88	24.4	19.8	N/A
Mesa, Inc.	5/3/93	56.2	53.7	15.9
Munsingwear, Inc.	10/1/90	164.0	N/A	132.6
National Gypsum Company	10/21/90	N/A	56.6	56.4
NH Holdings	5/15/93	N/A	47.2	38.3
Republic Mortgage Investors	4/18/75	N/A	N/A	12.1
Republic Steel Corporation	5/1/86	43.0	41.4	29.4
Revco D S Inc.	6/15/88	N/A	19.1	18.7
Smith International Inc.	3/7/86	9.7	1.0	N/A
Southeast Banking Corp.	9/19/91	18.6	15.4	4.9
Southland Corporation	3/22/90	N/A	30.5	30
Storage Technology Finance Corporation	10/31/84	18.5	N/A	11.3
Sunbeam Corporation	2/15/88	66.4	N/A	59.5
Talley Industries	4/15/91	N/A	20.7	N/A
Texaco Financial Services Inc.	4/7/87	N/A	16.1	4.9
Texaco Inc.	4/7/87	N/A	16.1	2.3
United Merchants and Manufacturers Inc.	7/12/77	N/A	N/A	28.0
Woodward & Lothrop Inc.	1/17/94	N/A	N/A	113.1
Zale Corp.	12/1/91	68.5	55.1	53.5
Average:		50.5	24.9	38.9

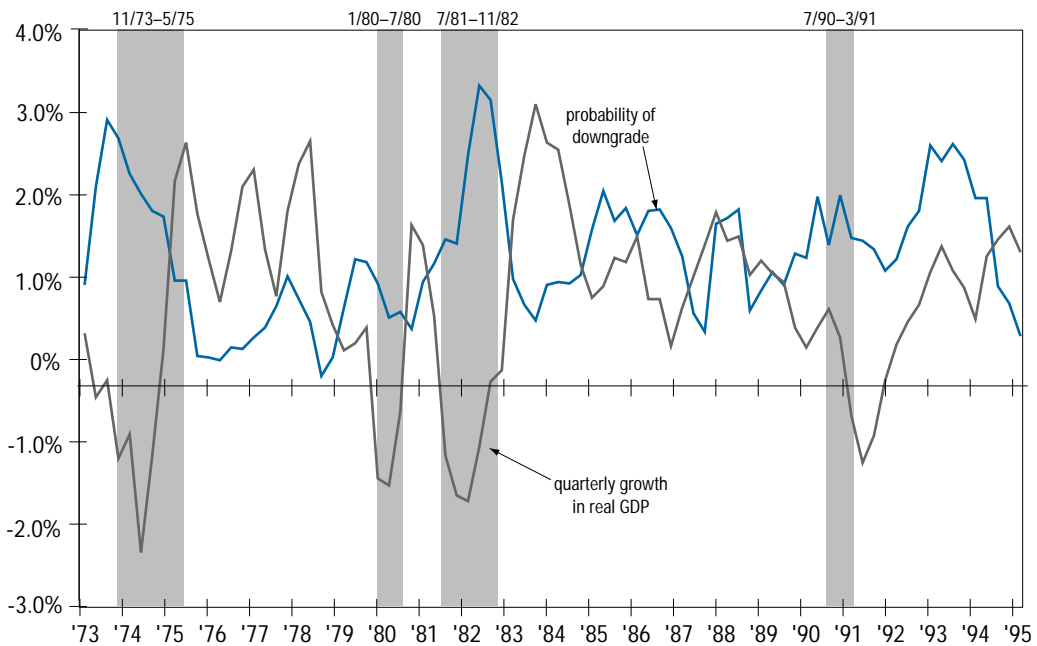
*Moody’s takes the date on which federal legislation providing for loan guarantees was signed into law as the default date.

Rating Transitions

Rating transitions are of interest to a wide variety of market participants. A downgraded issuer typically cannot place as much paper as desired and must rely on other, more expensive financing. For issuers relying on continued access to the cp market for project finance, a decline in credit quality as indicated by a downgrade could seriously affect the costs of completing the project. An investor holding downgraded cp faces an even less liquid secondary market than usual. If regulations require such an investor to close out the position, abnormal losses could be incurred. This section analyzes some of the basic trends in cp rating transitions over the past 23 years.

To document how the overall credit quality of the Moody's rated universe of issuers has evolved over time, we compute quarterly estimates of the probability of a downgrade for Prime-1-rated cp programs. We choose to focus on Prime-1 rated programs simply because they comprise the bulk of cp outstanding. In periods of declining aggregate credit quality, the probability of a downgrade will be high relative to periods of improving credit quality. Our estimate of the probability of a downgrade is simply the fraction of issuers with active cp programs rated Prime-1 as of the start of a given quarter that was downgraded by the end of that quarter. Figure 8 presents three quarter moving averages of these data for U.S.-domiciled issuers from the first quarter of 1973 (the first quarter for which sample sizes were large enough to produce reliable estimates) through the fourth quarter of 1994 against the quarterly growth rate of the U.S. real gross domestic product.

Figure 8 – Quarterly Downgrade Probability vs Real GDP Growth Rate



The probability of a downgrade was less, on average, for the period preceding 1982 than for the period following. Before 1982, the quarterly average downgrade probability was 0.72% and over the period from 1982 through 1994 it has averaged nearly twice that amount, 1.03%. The higher risk of a downgrade corresponds to the general deterioration in corporate credit quality that characterizes the 1980s. Recently, this trend seems to have reversed. Since the end of 1993, the quarterly downgrade probability has averaged just 0.34% – well below the 1982-1994 and 1973-1981 averages.

Also noticeable in this chart is a negative correlation between the risk of a downgrade and the rate at which real gross domestic product grows. This is intuitive, since during periods of rapid expansion, one would expect credit quality to be higher and the probability of a downgrade lower than usual. The simple correlation between these two time series over the period from the first quarter of 1973 to the fourth quarter of 1994 is -43%. This highlights the cyclical nature of short-term credit quality. While a firm's fundamental credit quality largely determines its ability to meet debt payments, liquidity crises can offset this ability in the short-term. Crises of this type are more common in a slack or contractionary economy. Because liquidity crises have the potential to affect the timely payment of short-term

debt, Moody's short-term ratings are especially sensitive to them. For this reason, the probability of a downgrade is negatively correlated with the business cycle.

Perhaps of most interest to investors seeking to avoid downgraded cp and issuers seeking long-term access to public short-term financing are the probabilities of rating changes of various sizes and directions. To indicate these, we have calculated rating transition matrices that efficiently summarize the probability, size and direction of possible rating changes for a specific time horizon.

The rating transition matrices presented in Table 7 give Moody's estimates of the risks of a rated cp program making the transition from the rating specified by the row heading to any other short-term rating category, "Default," or to the "Withdrawn Rating" status by the end of the specified time horizon. The percentages here are averages of the estimated probabilities for each complete, non-overlapping period from 1973⁵ through the first half of 1995. Our estimate of the probability of a rating change for a particular quarter is simply the fraction of rated cp programs at the start of the quarter that made the specified rating change. The 90-day rating transition matrix, for example, is based upon four non-overlapping periods per year (each of the four quarters) and 22.5 years in the period under study. Consequently, we have 90 independent observations of the 90-day probability of an issuers moving from each rating to each other rating.

Table 7 – Rating Transition Matrices

30-Day Transition Matrix

	P-1	P-2	P-3	NP	Default	Withdrawn Rating
P-1	99.23%	0.29%	0.00%	0.01%	0.00%	0.48%
P-2	0.53%	98.21%	0.47%	0.07%	0.00%	0.70%
P-3	0.08%	1.38%	94.57%	1.41%	0.02%	2.54%
NP	0.06%	0.47%	0.79%	93.29%	0.10%	5.28%

60-Day Transition Matrix

	P-1	P-2	P-3	NP	Default	Withdrawn Rating
P-1	98.45%	0.58%	0.00%	0.02%	0.00%	0.96%
P-2	1.07%	96.46%	0.90%	0.14%	0.01%	1.43%
P-3	0.15%	2.71%	89.46%	2.68%	0.03%	4.96%
NP	0.13%	1.00%	1.54%	87.11%	0.23%	10.00%

90-Day Transition Matrix

	P-1	P-2	P-3	NP	Default	Withdrawn Rating
P-1	97.67%	0.86%	0.01%	0.02%	0.00%	1.45%
P-2	1.60%	94.70%	1.30%	0.22%	0.01%	2.17%
P-3	0.26%	4.19%	84.57%	3.69%	0.08%	7.21%
NP	0.16%	1.11%	2.40%	81.93%	0.29%	14.10%

120-Day Transition Matrix

	P-1	P-2	P-3	NP	Default	Withdrawn Rating
P-1	96.90%	1.10%	0.01%	0.03%	0.00%	1.95%
P-2	2.10%	93.05%	1.61%	0.30%	0.01%	2.93%
P-3	0.31%	5.35%	80.50%	4.26%	0.11%	9.47%
NP	0.26%	2.01%	3.18%	75.33%	0.48%	18.75%

⁵1972's data was not included simply because transition probability estimates based on small samples, such as existed in that year, would have been unreliable.

Table 7 – Rating Transition Matrices (cont.)

180-Day Transition Matrix

	P-1	P-2	P-3	NP	Default	Withdrawn Rating
P-1	95.32%	1.63%	0.04%	0.04%	0.00%	2.97%
P-2	3.14%	89.70%	2.20%	0.49%	0.03%	4.44%
P-3	0.50%	8.13%	72.46%	5.14%	0.17%	13.60%
NP	1.13%	2.37%	4.77%	67.76%	0.59%	23.38%

270-Day Transition Matrix

	P-1	P-2	P-3	NP	Default	Withdrawn Rating
P-1	93.02%	2.42%	0.06%	0.08%	0.01%	4.42%
P-2	4.55%	84.97%	2.91%	0.66%	0.04%	6.87%
P-3	0.54%	11.37%	63.01%	5.74%	0.31%	19.03%
NP	1.53%	2.69%	7.37%	62.88%	0.00%	25.54%

365-Day Transition Matrix

	P-1	P-2	P-3	NP	Default	Withdrawn Rating
P-1	90.68%	3.07%	0.14%	0.10%	0.01%	6.00%
P-2	5.70%	80.53%	3.59%	0.79%	0.05%	9.34%
P-3	0.63%	14.34%	53.57%	6.56%	0.62%	24.28%
NP	2.33%	4.21%	4.94%	53.82%	0.00%	34.69%

In each of the matrices above, the (bold) diagonal elements are estimates of the probability of an issuer remaining at the same rating level over the specified time horizon. For example, in the 270-day transition matrix, the percentage in the third row and third column, 63.01%, indicates that an issuer holding a Prime-3 rating has only an estimated 63.01% chance of holding that rating over a 270-day period. The off-diagonal (not bold) elements indicate the estimated probabilities of the issuer transitioning to the other possible states by the end of the 270-day period. Looking again at the third row, first column 270-day transition matrix, a Prime-3-rated issuer has an estimated 0.54% chance of enjoying an upgrade all the way to the Prime-1 rating category within a 270-day time horizon. The percentages under the “Default” column heading are the estimated risks of default within the specified time horizon and those under the “Withdrawn Rating” column heading are the estimated risks of the rating being withdrawn by the end of the time horizon.⁶

The diagonal elements are dominant, indicating that ratings are most likely to remain unchanged over 30- through 365-day periods of time. Moreover, as Moody’s opinion of the credit quality of an issuer declines, the probability that that issuer will retain that rating generally declines. Hence, while a Prime-1-rated issuer has an estimated 90.68% chance of maintaining that rating over a 365-day period, a Prime-2-rated issuer has only an estimated 80.53% chance of doing so. The higher probability of a Prime-1-rated program maintaining its rating over a 365-day period indicates that Prime-1 is a relatively stable rating category and may be expected to last longer than the Prime-2 rating designation. The Prime-3 and Not Prime rating categories have the lowest probabilities of being maintained over a 365-day time period. For reasons ranging from the regulatory environment to the structure of the cp market and the definition of the Prime-3 rating, these ratings serve a transitional role. Regulations such as SEC Rule 2a-7 and pronounced investor risk aversion severely reduce the demand for cp rated below Prime-2. As a result, issuers downgraded to Prime-3 or Not Prime are faced with powerful incentives to either regain a higher rating or find other sources of short-term financing. Additionally, Prime-3 covers a small band of credit quality at the lower end of the investment-grade scale. Because it is more narrowly defined, issuers are more likely to transition out of it than other short-term rating categories. For these reasons, the likelihood of an issuer maintaining either of these ratings is relatively low.

The Moody’s Short-Term Rating System section of this report stated that the Prime-1, Prime-2, and Prime-3 rating categories can be thought of as measures of distance in time from the Not Prime rating

⁶It should be pointed out that Moody’s does not withdraw ratings because of credit deterioration. Moody’s simply downgrades such issuers. Moody’s may withdraw CP ratings for a variety of reasons: the issuing firm may have retired all or essentially all outstanding notes, or there may be such a small market for the firm’s cp that investor interest in the rating is severely limited. Only to the extent that higher risk firms are forced from the market and consequently, their ratings are withdrawn, is the “Withdrawn Rating” classification related to increased credit risk.

decision. This measure is closely related to the probability that an issuer will make the transition to the Not Prime rating category over a given time horizon. The probabilities given in the first three rows under the “NP” heading of each transition matrix are estimates of the chances of an issuer transitioning from any of the Prime ratings to the Not Prime rating over the given time horizon. For each time horizon from 30 days to one year, the probability of a transition to the Not Prime rating from a Prime rating is greater for lower credit ratings. This is an indication that Moody’s Prime rating system has been differentiating issuers on the basis of the length of time until the issuer reaches the Not Prime rating status.

The likelihood of an issuer defaulting on commercial paper also tends to increase as Moody’s opinion of the credit quality of the issuer declines. Over a 180-day period, for example, the estimated risks of default for Prime-1, Prime-2, Prime-3 and Not Prime cp are 0.00%, 0.03%, 0.17%, and 0.59% respectively. This pattern of increased risk of default for lower credit ratings is generally maintained for 30, 60, 90, 120, 270, and 365-day time periods as well. Noticeable exceptions are the Not Prime default rates for the 270- and 365-day time horizons, which are zero. This is because none of the 10 Moody’s-rated defaulters held the Not Prime rating either 270 or 365 days before default reflecting, in part, the strength of the orderly exit mechanism.

Conclusion

Commercial paper, almost exclusively a U.S.-based instrument just 15 years ago, enjoyed a great expansion during the eighties. Many countries set up domestic markets in order to allow firms and investors alike to take advantage of the benefits of short-term debt markets. In the latter part of the 1980s, however, the pace of defaults in many cp markets surged. Defaults began in a few domestic European markets in 1987, but spread to the larger U.S. and Euromarkets by 1989. Since that initial spike in default activity, the pace has slackened, though it has not subsided to its pre-1987 levels.

Over the period from 1972 through 1995 our research has uncovered the defaults of 39 issuers on more than \$3.6 billion of rated and unrated, publicly offered commercial paper. These defaults occurred predominantly in the larger USCP and EuroCP markets but also in several smaller and newer domestic markets. The recovery experience for defaulted cp holders has been generally favorable. While Moody’s estimates the expected severity of loss for senior unsecured bondholders at 55%, losses to cp investors have been somewhat smaller. In most cases losses have amounted to the inconvenience of payment delays or non-cash payments.

The U.S. commercial paper market achieves equilibrium, to a large extent, via quantity adjustment. This process is dubbed here an “orderly exit” mechanism. The motivations for quantity adjustment are many, but the decisive factors are cp investors’ risk aversion and the short maturity of the notes. This mechanism ensures that changes of credit quality of lesser magnitude than the transition to actual default carry serious consequences. For example, an issuer of USCP downgraded from Prime-1 to Prime-2, can expect to have to reduce its outstandings by 10%.

Partially because of the orderly exit mechanism, the probabilities of various rating changes are of great interest to investors and issuers alike. The rating transition matrices presented here are meant to give investors a better understanding of the risks of credit deterioration associated with each Moody’s rating category. They clearly indicate that higher short-term credit ratings are more stable than lower rating categories. They also indicate that the Prime-1, Prime-2 and Prime-3 ratings serve reliably as measures of the distance in time from the Not Prime rating decision. Also included are estimates of the risk of default for each short-term rating category. Over a 180-day time horizon, the risks of default for a Prime-1-, Prime-2-, Prime-3- and Not Prime-rated issuers are 0.00%, 0.03%, 0.17% and 0.59% respectively.

Commercial Paper Defaults Since January 1994

Aerovias de Mexico, S.A. de C.V.

Airline

\$37.5 million Commercial Paper

Aerovias de Mexico, S.A. de C.V. (Aeromexico), Mexico's leading airline, provides air transportation services within Mexico, the United States, and Europe. The company owns almost 55% of the Corporacion Mexicana de Aviacion (Mexicana), the second largest carrier in the Mexican market. The two companies' debt totals some \$1 billion. Aeromexico, hammered by more efficient competitors, has been in a financial tailspin for over a year. In addition, the company discovered in the fall of 1994 that \$50 million in cash was missing, apparently having been absconded by a former chairman who had fled the country. This provided the final blow to the company, which already had been in negotiations with lenders. Aeromexico forced a \$25 million commercial paper rollover due on September 15, 1994. The outstanding remainder of the cp program, \$12.5 million was also forced to roll over after September 15, 1994.

•09/15/94 – missed payments on commercial paper.

Confederation Life Insurance Company

Life insurance provider

C\$203.1 million Eurocommercial Paper [US\$ 147.3 million]

Confederation Life Insurance Company, one of Canada's top five insurance companies, provides insurance for over 500,000 policyholders worldwide. The company's problems started in the late 1980s when it began to invest heavily in North American real estate. By 1989, 71% of the company's assets were in high-risk real estate or mortgages. As the real estate market soured, so did Confederation's prospects. The latest regulatory filing reports a C\$147 million loan loss and a C\$29 million net loss for fiscal year 1993. After an Office of the Superintendent of Financial Institutions audit in 1993, Confederation publicly announced an initiative to raise capital, signaling a willingness to heed of regulators' recommendations. The failure of the company to secure a strategic alliance with Great-West Life Assurance Co. in July 1994, signaled its demise and federal regulators seized Confederation on August 11, 1994, to ensure an orderly liquidation. On the day of the seizure, Confederation Life Insurance Company had C\$203.1 million (US\$ 147.3 million) in Eurocommercial Paper outstanding.

•08/11/94 – seized by regulators.

Confederation Treasury Services U.K. Ltd.

Life insurance provider

£132.2 million Eurocommercial Paper [US\$ 203.2 million]

Confederation Treasury Services U.K. Ltd. is a wholly owned subsidiary of Confederation Treasury Services Limited, which is a wholly owned subsidiary of Confederation Life Insurance Company (see accompanying critique). As of August 11, 1994, the day Canadian regulators seized Confederation Life Insurance Company, the company had £132.2 million in Eurocommercial paper outstanding (US\$203.2 million).

•08/11/94 – seized by regulators.

Grupo Simec, S.A. de C.V.

Steel manufacturer

\$10 million Eurocommercial Paper

Grupo Simec, S.A. de C.V., headquartered in Guadalajara, Mexico, is a mini-mill steel producer. The company produces a broad range of small and medium non-flat structural steel products and extruded aluminum products for use in the residential, commercial and industrial construction markets. Simec was incorporated on August 22, 1990, to serve as a holding company for Grupo Sidek S.A. de C.V.'s steel and aluminum operations. The devaluation of the Mexican Peso in December 1994 effectively increased the company's dollar denominated debt by 40% overnight. On missing the payments on March 15, Grupo Sidek, who guaranteed Grupo Simec's Eurocommercial paper, stated that it had sufficient cash on hand to make the payments, but believed it was better to use the cash for daily operations. Grupo Simec made the payments two days later on March 17, 1995, as Grupo Sidek bowed to intense industry criticism.

- 03/15/95 – missed \$10 million payment on commercial paper.
 - 03/17/95 – made up \$10 million payment on commercial paper.
-

Grupo Situr, S.A. de C.V.

Tourism

\$5 million Eurocommercial Paper

Grupo Situr, S.A. de C.V., based in Guadalajara, Mexico, is Mexico's principal developer of integrated resorts. The company, controlled by Grupo Sidek S.A. de C.V., is one of the country's leading hotel owners and operators, a leader in the timeshare units and is also involved in the planning, construction and marketing of residential and commercial developments. The devaluation of the Mexican Peso in December 1994 effectively increased the company's dollar denominated debt by 40% overnight. On missing the payments on March 15, Grupo Sidek, who guaranteed Grupo Situr's Eurocommercial paper, stated that it had sufficient cash on hand to make the payments, but believed it was better to use the cash for daily operations. Grupo Situr made the payments two days later on March 17, 1995, as Grupo Sidek bowed to intense industry criticism.

- 03/15/95 – missed \$5 million payment on commercial paper.
 - 03/17/95 – made up \$5 million payment on commercial paper.
-

Grupo Synkro, S.A. de C.V.

Apparel

\$17 million Eurocommercial Paper

Grupo Synkro, S.A. de C.V. is a holding company whose subsidiaries are engaged in the manufacture and sale of hosiery, clothing, and stockings. Its products are sold under brand names, and it exports mainly to Latin America and Europe. In January 1994, the company purchased the second-largest U.S. hosiery player, Kayser-Roth. Although Grupo Synkro reported an increase in revenues for the third quarter of 1995, it was attributable primarily to the December 1994 devaluation of the Mexican peso. A difficult retail environment in the Mexican, Argentinean, and U.S markets negatively impacted Grupo Synkro's operating results. Its newly purchased U.S. subsidiary, Kayser-Roth, as well as subsidiaries in Argentina and Mexico, Legwear Argentina and Legwear Mexico, suffered from slack demand in the U.S., and the volatile economic environment prevailing in Central and South America following Mexico's Peso devaluation. Grupo Synkro approached its banks in September 1995 with the hope of restructuring its debt. A month and a half later on November 11, 1995, the company forced the rollover of its Eurocommercial paper program.

- 11/11/95 – forced the roll-over of commercial paper.
-

Kapital Haus, S.A. de C.V.

Captive finance subsidiary

\$4.5 million Eurocommercial Paper

Kapital Haus, S.A. de C.V., is a subsidiary of Grupo Sidek, S.A. de C.V., a Mexican conglomerate with vast interests in steel and tourism. Kapital Haus primarily factors accounts receivable from developers who purchase properties from Grupo Situr as well as structures certain transactions for Sidek, Simec, Situr and their respective subsidiaries. The devaluation of the Mexican Peso in December 1994 effectively increased the company's dollar denominated debt by 40% overnight. On missing the payments on March 14, Grupo Sidek, who guaranteed Kapital Haus' Eurocommercial paper, stated that it had sufficient cash on hand to make the payments, but believed it was better to use the cash for daily operations. Kapital Haus made the payments three days later on March 17, 1995, as Grupo Sidek bowed to intense industry criticism.

- 03/14/95 – missed \$4.5 million payment on commercial paper.
 - 03/17/95 – made up \$4.5 million payment on commercial paper.
-

Metallgesellschaft Aktiengesellschaft

Chemical producer

DM 509.2 million Eurocommercial Paper [US\$292.8 million]

Metallgesellschaft Aktiengesellschaft (MG), headquartered in Frankfurt, Germany, is a conglomerate of metal-related and industrial businesses. Consolidated sales increased by 17% for the first half of 1993 relative to 1992's first half, but matters took a sudden turn for the worse when crude oil prices dropped by some \$5 per barrel in November 1993. MG Corp, MG's U.S. operation, had over-extended itself by building up long-term commitments to deliver up to 160 million barrels of oil over five years, eight times its commitment in October 1992. The nature of the commitment exposed the company to market risk in the short-term price of oil products. Although the company hedged this risk

using NYMEX and over-the-counter forward and futures contracts, the strategy employed only hedged the company's position if prices rose. Subsequent to the \$5 per barrel slide, MG Corp was subject to margin calls and illiquidity. In a revised report, MG reported a loss of 1.87 billion marks (pre-tax) for fiscal 1993 of which about one-half stemmed from the oil transactions in the US. On January 7, 1994, the company forced the roll-over of DM834 million of Eurocommercial Paper.

•01/07/94 – forced the roll-over of commercial paper.

Metallgesellschaft Finance B.V.

Finance conduit

\$200 million Eurocommercial Paper

Metallgesellschaft Finance B.V. is a wholly owned subsidiary of Metallgesellschaft Aktiengesellschaft (see accompanying critique).

•01/07/94 – forced the roll-over of commercial paper.

Zanella Hermanos y Cia.

Motor vehicles manufacturer

\$10.5 million of Eurocommercial Paper

Zanella Hermanos y Cia. is an Argentinean manufacturer and seller of motor vehicles and motorbikes. A slowdown in consumption produced a net loss of \$7.7 million for the company in the second half of 1994 against a gain of \$2.8 million between January and June. Operating income in the six months to December fell to \$1.9 million from \$5.3 million. With the collapse of the Bank Extrader S.A., its underwriter, on January 26, 1995, Zanella did not have access to the necessary resources to roll over its Eurocommercial Paper. The company was planning to refinance its commercial paper by issuing a medium-term convertible note. However, the devaluation of the Mexican peso in December 1994 significantly reduced the accessibility of South American companies to the capital markets. The company did not make payments on \$10.5 million of Eurocommercial Paper due February 13, 1995.

•02/13/95 – missed payments on Eurocommercial Paper.

Table 8 – Summary of Rating Transition Probability Distributions (%)

Each entry describes the (Minimum, 10th percentile, Median, 90th percentile, Maximum) for the probability of a short-term rating changing from the row rating to the column rating or default within the specified time horizon. The 10th percentile is that datapoint which is larger than 10% of the observations in the sample. The 90th percentile is analogously defined.

30-Day Transition Matrix

	P-1	P-2	P-3	NP	Default
P-1	(96.3, 98.1, 99.3, 100.0, 100.0)	(0.0, 0.0, 0.2, 1.0, 1.7)	(0.0, 0.0, 0.0, 0.0, 0.2)	(0.0, 0.0, 0.0, 0.1, 0.5)	(0.0, 0.0, 0.0, 0.0, 0.0)
P-2	(0.0, 0.0, 0.4, 1.7, 3.5)	(94.5, 96.0, 98.4, 100.0, 100.0)	(0.0, 0.0, 0.4, 1.6, 4.0)	(0.0, 0.0, 0.0, 0.5, 1.8)	(0.0, 0.0, 0.0, 0.0, 0.5)
P-3	(0.0, 0.0, 0.0, 0.0, 5.9)	(0.0, 0.0, 0.0, 7.4, 23.1)	(71.4, 83.8, 95.0, 100.0, 100.0)	(0.0, 0.0, 0.0, 7.4, 28.6)	(0.0, 0.0, 0.0, 0.0, 4.2)
NP	(0.0, 0.0, 0.0, 0.0, 5.9)	(0.0, 0.0, 0.0, 0.0, 50.0)	(0.0, 0.0, 0.0, 3.9, 50.0)	(0.0, 66.7, 98.0, 100.0, 100.0)	(0.0, 0.0, 0.0, 0.0, 12.1)

60-Day Transition Matrix

	P-1	P-2	P-3	NP	Default
P-1	(94.9, 96.8, 98.6, 99.7, 100.0)	(0.0, 0.0, 0.5, 1.6, 3.1)	(0.0, 0.0, 0.0, 0.0, 0.2)	(0.0, 0.0, 0.0, 0.1, 0.5)	(0.0, 0.0, 0.0, 0.0, 0.0)
P-2	(0.0, 0.0, 0.9, 2.6, 5.2)	(91.0, 93.3, 96.6, 99.0, 99.5)	(0.0, 0.0, 0.5, 2.6, 5.0)	(0.0, 0.0, 0.0, 0.9, 2.3)	(0.0, 0.0, 0.0, 0.0, 0.5)
P-3	(0.0, 0.0, 0.0, 0.0, 5.9)	(0.0, 0.0, 0.0, 10.3, 23.1)	(53.3, 76.1, 90.8, 100.0, 100.0)	(0.0, 0.0, 0.0, 12.9, 40.0)	(0.0, 0.0, 0.0, 0.0, 4.2)
NP	(0.0, 0.0, 0.0, 0.0, 6.3)	(0.0, 0.0, 0.0, 4.2, 50.0)	(0.0, 0.0, 0.0, 5.6, 50.0)	(0.0, 58.5, 93.9, 100.0, 100.0)	(0.0, 0.0, 0.0, 0.0, 14.8)

90-Day Transition Matrix

	P-1	P-2	P-3	NP	Default
P-1	(93.3, 95.7, 97.9, 99.5, 99.7)	(0.0, 0.1, 0.7, 2.2, 2.7)	(0.0, 0.0, 0.0, 0.0, 0.2)	(0.0, 0.0, 0.0, 0.1, 0.5)	(0.0, 0.0, 0.0, 0.0, 0.0)
P-2	(0.0, 0.0, 1.4, 3.7, 5.3)	(88.8, 90.6, 94.6, 98.1, 99.0)	(0.0, 0.0, 1.0, 3.4, 6.8)	(0.0, 0.0, 0.0, 1.7, 2.3)	(0.0, 0.0, 0.0, 0.0, 0.5)
P-3	(0.0, 0.0, 0.0, 1.9, 5.9)	(0.0, 0.0, 2.2, 12.5, 25.0)	(53.3, 65.8, 85.4, 98.8, 100.0)	(0.0, 0.0, 0.0, 13.9, 40.0)	(0.0, 0.0, 0.0, 0.0, 4.2)
NP	(0.0, 0.0, 0.0, 0.0, 6.3)	(0.0, 0.0, 0.0, 5.4, 33.3)	(0.0, 0.0, 0.0, 7.3, 50.0)	(0.0, 38.5, 89.5, 100.0, 100.0)	(0.0, 0.0, 0.0, 0.0, 14.8)

120-Day Transition Matrix

	P-1	P-2	P-3	NP	Default
P-1	(91.8, 94.1, 97.1, 99.2, 99.6)	(0.0, 0.2, 1.0, 2.7, 3.8)	(0.0, 0.0, 0.0, 0.1, 0.2)	(0.0, 0.0, 0.0, 0.2, 0.6)	(0.0, 0.0, 0.0, 0.0, 0.1)
P-2	(0.0, 0.4, 2.0, 3.9, 7.1)	(86.2, 88.6, 92.9, 97.0, 97.5)	(0.0, 0.0, 1.0, 4.6, 6.1)	(0.0, 0.0, 0.0, 2.1, 2.8)	(0.0, 0.0, 0.0, 0.0, 0.4)
P-3	(0.0, 0.0, 0.0, 2.2, 5.9)	(0.0, 0.0, 4.4, 14.4, 23.5)	(53.3, 61.9, 82.1, 94.1, 100.0)	(0.0, 0.0, 0.0, 13.2, 40.0)	(0.0, 0.0, 0.0, 0.0, 4.2)
NP	(0.0, 0.0, 0.0, 1.9, 6.3)	(0.0, 0.0, 0.0, 6.3, 50.0)	(0.0, 0.0, 0.0, 8.8, 50.0)	(0.0, 30.0, 85.7, 100.0, 100.0)	(0.0, 0.0, 0.0, 0.3, 15.8)

180-Day Transition Matrix

	P-1	P-2	P-3	NP	Default
P-1	(89.7, 92.1, 95.5, 98.5, 99.1)	(0.2, 0.4, 1.5, 3.2, 4.7)	(0.0, 0.0, 0.0, 0.2, 0.6)	(0.0, 0.0, 0.0, 0.2, 0.6)	(0.0, 0.0, 0.0, 0.0, 0.0)
P-2	(0.0, 0.6, 2.8, 7.0, 8.8)	(81.0, 83.0, 88.9, 95.5, 96.4)	(0.0, 0.4, 1.9, 5.0, 7.0)	(0.0, 0.0, 0.0, 2.1, 3.7)	(0.0, 0.0, 0.0, 0.3, 0.5)
P-3	(0.0, 0.0, 0.0, 2.2, 10.5)	(0.0, 0.0, 7.1, 20.9, 25.0)	(37.5, 48.0, 71.4, 90.9, 94.1)	(0.0, 0.0, 2.1, 19.8, 32.1)	(0.0, 0.0, 0.0, 0.0, 4.2)
NP	(0.0, 0.0, 0.0, 5.4, 20.0)	(0.0, 0.0, 0.0, 7.0, 33.3)	(0.0, 0.0, 2.1, 12.3, 50.0)	(0.0, 8.0, 78.6, 96.9, 100.0)	(0.0, 0.0, 0.0, 0.0, 14.8)

270-Day Transition Matrix

	P-1	P-2	P-3	NP	Default
P-1	(85.6, 88.8, 93.2, 97.5, 97.9)	(0.6, 0.8, 2.1, 4.6, 5.6)	(0.0, 0.0, 0.0, 0.3, 0.6)	(0.0, 0.0, 0.0, 0.3, 0.6)	(0.0, 0.0, 0.0, 0.0, 0.1)
P-2	(0.0, 2.0, 4.4, 7.6, 11.6)	(76.4, 76.8, 84.8, 92.6, 93.6)	(0.5, 0.8, 2.1, 5.9, 9.7)	(0.0, 0.0, 0.0, 3.3, 4.3)	(0.0, 0.0, 0.0, 0.4, 0.4)
P-3	(0.0, 0.0, 0.0, 2.0, 10.5)	(0.0, 0.0, 9.9, 26.3, 31.3)	(31.3, 37.8, 61.2, 88.4, 90.9)	(0.0, 0.0, 0.0, 24.5, 31.6)	(0.0, 0.0, 0.0, 0.0, 9.4)
NP	(0.0, 0.0, 0.0, 7.2, 20.0)	(0.0, 0.0, 0.0, 9.7, 20.0)	(0.0, 0.0, 5.5, 24.1, 50.0)	(0.0, 16.0, 70.9, 98.2, 100.0)	(0.0, 0.0, 0.0, 0.0, 0.0)

365-Day Transition Matrix

	P-1	P-2	P-3	NP	Default
P-1	(82.6, 86.5, 90.4, 96.4, 97.2)	(0.9, 1.2, 2.9, 5.5, 6.3)	(0.0, 0.0, 0.1, 0.4, 0.6)	(0.0, 0.0, 0.0, 0.5, 0.6)	(0.0, 0.0, 0.0, 0.1, 0.1)
P-2	(0.5, 2.3, 5.5, 9.5, 13.2)	(67.9, 70.6, 81.1, 90.6, 91.2)	(1.0, 1.1, 2.6, 7.7, 7.9)	(0.0, 0.0, 0.4, 2.7, 3.5)	(0.0, 0.0, 0.0, 0.4, 0.4)
P-3	(0.0, 0.0, 0.0, 2.0, 11.8)	(0.0, 0.0, 13.8, 33.1, 37.5)	(18.8, 32.2, 57.3, 81.2, 82.4)	(0.0, 0.0, 3.5, 19.4, 28.6)	(0.0, 0.0, 0.0, 0.4, 0.9, 4)
NP	(0.0, 0.0, 0.0, 12.4, 20.0)	(0.0, 0.0, 0.0, 13.8, 20.0)	(0.0, 0.0, 5.4, 13.3, 18.8)	(0.0, 0.0, 59.3, 93.1, 100.0)	(0.0, 0.0, 0.0, 0.0, 0.0)