Who is #1?
A New Approach to Ranking U.S. IPO Underwriters*

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Comments welcome.

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Abstract

We introduce a new approach to ranking U.S. IPO underwriters, the ELO system. This system was originally developed for ranking chess players, and it has subsequently been used to rank competitors in many other areas, including bowling, college football, golf, on-line gaming, and soccer. In our implementation, we view an IPO as a contest in which participating members of the underwriting syndicate compete for prestige as measured by their relative proportion of shares underwritten. Banks that underwrite a greater proportion of the shares offered in a particular IPO are viewed as "defeating" those with smaller allocations. Based on 5,337 IPOs from 1986-2002, we use this approach to rank 130 banks actively participating in IPO managing syndicates and 690 banks actively participating in IPO non-managing syndicates. Over the entire sample period, the highest ranked underwriters are Morgan Stanley in the managing syndicate rankings and Wertheim in the non-managing syndicate rankings. Over the most recent four years, Morgan Stanley is still the highest rated managing underwriter with CIBC Oppenheimer the number one non-managing bank.

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IPO researchers have long been interested in measuring underwriter reputation. Concurrently, there has been (and continues to be) enormous interest in ranking techniques for use in competitive sports (such as the BCS rankings in college football), and a number of relatively sophisticated ranking schemes have been developed and are in use. Our primary goal in this study is to merge these two research streams and present a new approach to evaluating IPO underwriter reputation that is grounded in competition-based ranking technology.

Specifically, we implement the well-known and widely-used ELO system, which was originally created for ranking chess players and continues to be used for that purpose. It has also been used to rank competitors in many other areas, including bowling, college football, golf, soccer, and, most recently, on-line gaming. One attractive feature of the ELO system is that it considers not only a contestant's record of wins and losses, but also the quality of its competition (i.e., its "strength-of-schedule"). That is, under the ELO system, a 7-4 record against a set of high-quality opponents could give a contestant a higher ranking than a 10-1 record against a set of weaker opponents.

In our analysis, we view an IPO as a contest in which members of the underwriting syndicate compete for prestige as measured by their relative proportion of shares underwritten. Banks that underwrite a greater proportion of the shares offered in a particular IPO are viewed as "defeating" those with smaller allocations. The proportion of shares underwritten in an IPO by a bank corresponds to its relative positioning on the IPO's tombstone advertisement. Thus, our measure is similar in spirit to the Carter-Manaster (1990) ranking system. However, it offers several potentially significant advantages. First, the ELO system is straightforward to computerize, so an unlimited number of IPOs can be used to rank banks, and the rankings can be easily updated to include new IPOs, as well as generated for various subsets of IPOs (e.g., large

versus small IPOs, high-tech versus low-tech, etc.). Second, the rating scale is continuous, so ties are uncommon, and the ratings contain more information than a purely ordinal scale such as Carter-Manaster. Third, intransitivities and changes in prestige level pose no problem. Finally, ELO rankings explicitly incorporate opponent strength. As a result, a bank's prestige depends on both its relative position in a tombstone ad and the quality of the other banks participating in the IPO. In contrast, as pointed out by Loughran and Ritter (2004), under the Carter-Manaster system, a bank could garner a relatively high ranking by appearing exclusively in the top underwriting bracket of several penny stock offerings.

Previous studies using the Carter-Manaster ranking system only examine the non-managing portion of the underwriting syndicate. But, as noted in Bradley, Jordan, and Ritter (2003), Corwin and Schultz (2004), and Loughran and Ritter (2004), the number of managing underwriters has grown while the number of number of non-managing underwriters has fallen. This change in the structure of IPO underwriting syndicates allows for the calculation of two sets of ELO rankings, one for participants in non-managing syndicates and one for participants in managing syndicates. We appear to be the first to develop separate rankings using information from the managing portion of underwriting syndicates.

Based on 5,337 IPOs from 1986-2002, we rank 130 banks actively participating in IPO managing syndicates and 690 banks actively participating in IPO non-managing syndicates. Over the entire sample period, the highest ranked underwriters are Morgan Stanley in the managing syndicate rankings and Wertheim in the non-managing syndicate rankings. Over the most recent four years, Morgan Stanley is still the highest rated managing underwriter with CIBC Oppenheimer the number one non-managing bank.

The remainder of this paper proceeds as follows. Section I provides an overview of the formation and operation of underwriting syndicates and underscores the growing importance of

managing banks in the underwriting process. Section II discusses previously developed systems for ranking underwriters. Section III describes our data and presents summary results on changes in syndicate composition over our sample period. Section IV explains the ELO system, presents our ELO rankings, and compares them to rankings obtained using other methods. The paper concludes in Section V.

I. Underwriting Syndicates

In this section, we briefly discuss the formation and operation of IPO underwriting syndicates. More extensive discussions can be found in Chen and Ritter (2000) and Corwin and Schultz (2004). The Securities Industry Association's *2003 Capital Markets Handbook*, from which much of our discussion is drawn, is a particularly thorough source. Throughout this discussion, we refer to a standard, negotiated-underwriting, equity IPO.

Syndicate formation begins when an issuing firm decides which underwriter will be "given the books," thereby designating the lead underwriter, also known as the "book running manager." This selection may be based on a "bake-off" or "beauty contest," in which two or more underwriters compete. Some firms may not have such a competition because of the unwillingness of underwriters to participate or because they decide to choose a particular bank based on an existing relationship.

The issuing firm and its book manager decide on the number and identity of the underwriters to include in the managing syndicate. Ordinarily, the names of the co-managers (if any) appear on the cover of the prospectus, with the book manager's name on the upper left. In recent years, the use of one or more co-managers has become commonplace.[1] In another recent trend, some

[1] The book and co-managing underwriters often provide research coverage for the IPO firm [Bradley, Jordan, and Ritter (2003)]. Loughran and Ritter (2004) argue that there has been an increased desire for research coverage in recent years. This increased desire could provide at least a partial explanation for the increase in the number of co-managers.

deals have joint bookrunners whose names appear side-by-side above the names of any co-managers.

The book underwriter, in consultation with the issuing firm, completes the IPO's underwriting syndicate by selecting a set of non-managing banks. According to the *Capital Markets Handbook*, the criteria used might include (1) financial strength, (2) ability to distribute the security to a particular type of buyer and/or geographic area, (3) research capability, (4) market making strength, and (5) geographic location of the issuing firm. Corwin and Schultz (2004) document that prior relationships are a very important determinant of syndicate membership; book underwriters have a strong tendency to rely repeatedly on the same syndicate members. They also show that geography matters; underwriters are more likely to be included if they are located in the same state as the issuer, particularly if the book manager is not. Finally, underwriters may also be included at the issuing firm's request because they have an historical banking relationship with the issuing firm or a business relationship of some sort.

The list of all participating underwriters is compiled into a "bracket list" by the bookrunner. Each bracket contains underwriters with an equal "commitment," which is the number of shares an underwriter is contractually obligated to purchase. Preliminary lists and proposed bracketing may be prepared. The "final underwriting account" contains all of the names and underwriting commitments and appears in the final prospectus "underwriting" section. This list of underwriter names and commitments is the primary source data used to calculate our ELO rankings.

The top bracket in the final bracketing is called the "major" bracket. The next bracket is the first "submajor" bracket, followed by the second submajor bracket, and so on. The submajor brackets are also referred to as "out of town" brackets. Some offerings have had a special bracket for e-brokers. The phrase "bulge bracket" is often encountered, referring to a bracket above the major bracket. However, such brackets only appear in debt offerings.

The final bracketing also determines a firm's "appearance" (i.e., its relative position) on any tombstone advertisements with the names of underwriters appearing in alphabetical order within each bracket. On rare occasions, when a dispute exists, a bank may elect non-appearance, meaning it participates in the offering, but declines to have its name listed on the tombstone. The lead underwriter may also designate "selected dealers" who are not part of the syndicate but nonetheless participate in the distribution of the offering.

A bank's commitment in an offering is not necessarily the number of shares that it will receive for resale (known as the "retention" or "takedown"). The actual allocation of shares for resale is at the discretion of the book underwriter. However, the commitment is the basis for allocating the underwriting fee portion of the gross spread and also future contributions to any litigation and price-stabilization expenses.[2]

In the past, the members of the non-managing syndicate had a genuine selling and underwriting (i.e., risk-bearing) function, but their role has since diminished greatly. Typically, and particularly in recent years, the book manager, and to a lesser extent the co-managers, capture the lion's share of the selling concession as they receive credit for selling a substantial portion of the shares for sale to institutions (the "institutional pot"). In addition, the percentage of shares underwritten by non-managing members of the underwriting syndicate has decreased substantially. Thus, the non managing underwriters often find themselves in the position of merely sharing in the risk (and the associated underwriting fees) from underwriting a

[2] The gross spread is composed of three different fees: underwriting fees, management fees, and the selling concession. The underwriting fee is split proportionately based on each bank's underwriting commitment. Managing underwriters share in the management fees, with the book underwriter typically receiving a disproportionately high portion. Finally, the selling concession is distributed to those banks that are credited with selling the shares of the IPO. See Chen and Ritter (2000) for a more detailed discussion.

relatively small portion of the IPO.[3] In addition, the already small underwriting fees are even further reduced by netting out travel, legal, advertising, price stabilization losses, and other expenses. In fact, a member of the non-managing syndicate may actually end up with a bill to pay rather than earning positive net revenues. But, having their names posted on the same tombstone notice as the "white shoe" companies is evidently enough incentive for the lower-tier banks to strive to appear in the non-managing syndicates. It bestows a sense of prestige, and it is inexpensive advertising.

II. Alternative Ranking Procedures

Extending back at least to Logue (1973), IPO researchers have often used a measure of lead underwriter prestige or reputation in their analyses. Three basic procedures have been used to create these measures: subjective classification, Carter-Manaster (1990) tombstone ranks, and Megginson-Weiss (1991) market share percentages. With subjective ranking, the researcher classifies banks based on either his or her perceptions of prestige or on the opinion from experienced industry professionals. For instance, Johnson and Miller (1988) subjectively assign underwriters into four groups based on their assessment of prestige. Carter and Manaster measure an investment bank's prestige level by examining the ordering of underwriters in IPO tombstone announcements, a purely objective measure. Investment banks placed higher in the tombstone receive higher ranks. The Megginson and Weiss approach is also purely objective. In this case, prestige is measured by calculating the market share of the different investment banks. Banks with higher market shares are deemed more prestigious.[4]

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[3] Discussions with investment bankers indicate that the increased concentration of the selling function through the book and co-managing underwriters is because buy-side institutional clients have become larger by an order of magnitude in the 1990s. These clients can now purchase larger baskets of common stock. In addition, the capacity of the larger banks to handle retail clients has grown over time through expansions and acquisitions.

[4] Carter, Dark, and Singh (1998) compare the three ranking systems and conclude that the Carter-Manaster system is more effective in explaining IPO initial returns during the 1979-1991 period than the Johnson and Miller (1988) and Megginson and Weiss (1991) systems.

A. The Carter-Manaster (1990) system

A.1. Summary of the Carter-Manaster ranking system

The Carter-Manaster system is based on the premise that investment bankers jealously guard their names and the order in which their names appear on IPO tombstones, much in the nature of the ordering of Hollywood stars' names on movie billboards. As discussed in the previous section, an investment bank's positioning on the IPO's tombstone corresponds to its commitment in the offering. As an example, consider the November 9, 1999, IPO by United Parcel Service (UPS). UPS offered a total of 87.52 million shares domestically and 21.88 million shares internationally at an offer price of $50 a share (a $5.47 billion offering). Table I provides information on the underwriting of the domestic and international portions of the IPO. Figure 1 presents the tombstone advertisement for the UPS IPO, as printed in the November 30, 1999 issue of the *Wall Street Journal.*

<<Insert Table I and Figure 1 about here>>

As shown in Table I, there are 44 banks listed as members of the UPS domestic underwriting syndicate and 14 banks in the international syndicate. Morgan Stanley served as the book manager. In addition to Morgan Stanley, the domestic syndicate has five co-managers and 38 non-managers (16 at the 1,000,000 share commitment level and 22 at the 500,000 share level). The international tranche is composed of six co-managers (all international divisions or subsidiaries of the domestic lead and co-managers) and eight members of the non-managing syndicate (each with a 200,000 share commitment). Morgan Stanley's role as the book manager is reflected by its position on the tombstone (i.e., top left) with co-managers listed in the same font below or to the right. Domestic non-managers follow according to their commitment level. Finally, the international managers and non-managers are listed at the bottom of the tombstone.

The Carter-Manaster system excludes the book manager and co-managers and ranks the remaining banks based on their position in the non-managing syndicate. Thus, the 16 investment banks in the upper portion of the domestic non-managing syndicate (i.e., those with 1,000,000 shares) are deemed to be more prestigious than the 22 investment banks in the lower portion (i.e., those with 500,000 shares). Accordingly, ABN-Amro (1,000,000 shares) is deemed to be a more prestigious underwriter than Sanford C. Bernstein (500,000 shares). Concerning the relative position in the tombstone, Carter and Manaster (1990), quoting from the financial press, state that underwriters "aggressively defend their place in the hierarchy, even to the point of pulling out of profitable deals." Consequently, we can infer that the underwriters offering 1,000,000 shares are willing to associate with each other, but might refuse to participate in an IPO if they were lumped in with the lower prestige underwriters offering 500,000 shares. Carter and Manaster (1990) do not discuss the ranking of the members of an IPO's international syndicate.[5]

With the Carter-Manaster system, additional tombstone announcements are examined to further refine the rankings of the 38 domestic non-managing underwriters in the UPS IPO, as well as other underwriters participating in other IPOs. Both Carter and Manaster (1990) and Carter, Dark, and Singh (1998) explain the manual sorting process used to rank underwriters from a series of tombstone announcements. As described in these studies, the Carter-Manaster algorithm aggregates the tombstone information such that each bank is assigned an integer rank on a purely ordinal 0-9 scale, with 9 being the highest underwriter ranking.[6]

A few other observations can be made concerning the UPS IPO. First, the ranking within the domestic non-managing syndicate is as expected. The banks offering 1,000,000 shares appear, for the most part, to be more prestigious than those in the group offering 500,000 shares.

[5] In principle, the Carter-Manaster system could be adapted to rank members of the international syndicate by treating the non-managing international underwriters as if they appeared on a separate tombstone (i.e., as if it were in another IPO).

[6] Non-integer ranks occur because, on occasion, different tombstones imply different integer ranks for the same bank. In these cases, the different ranks are simply averaged.

However, none of the "big" underwriters appear within these two groups. That is, the most prestigious underwriters appear only in the managing syndicate.

A.2. Problems with the Carter-Manaster ranking system

Despite their popularity, there are a few potential drawbacks to Carter-Manaster ranks. First, the scale is integer-valued and purely ordinal. Because it is integer-valued, it has limited ability to discriminate between banks of similar, but not identical prestige. For example, a relatively large number of banks have the highest ranking (9), but we conjecture that most industry observers would not view them as truly equal in prestige. Also, in recent years, more than half of IPOs have lead underwriters with Carter-Manaster ranks of either 8 or 9, which makes it difficult to draw inferences about the influence of the relative prestige of lead underwriters.

Perhaps a more significant issue is that the Carter-Manaster algorithm is based on the existence of a completely rigid hierarchy, at least over the period studied. That is, every underwriter with a Carter-Manaster rank of N never appears in the same bracket of a tombstone with an underwriter of rank N-1 or lower. Thus, each bracket should be composed of underwriters of the same prestige level (e.g., an underwriter with a rank of 9 will only appear in a bracket with other underwriters with a rank of 9, 8s only appear with 8s, and so on.) In reality, underwriters of different prestige levels often appear in the same bracket of an IPO. Although less common, intransitivities also occur, but the Carter-Manaster system does not formally allow for "upsets," nor does it allow for banks to gain or lose sufficient prestige to move up or down in the rankings.[7] Moreover, such prestige migration is an interesting question in its own right, and we examine it in depth in a subsequent section.

To give an example of some of the practical problems with the rigid hierarchy assumption, we examine the domestic non-managing underwriting syndicate for the Goldman Sachs IPO. The

[7] Non-integer rankings in Carter and Manaster (1990) and Carter, Dark, and Singh (1998) are the result of averaging conflicting integer ranks when intransitivities occur across different time periods.

non-managing syndicate for the Goldman Sachs IPO has 116 underwriters with four brackets, thereby providing an unambiguous ordinal ranking with four levels. A comparison of the UPS and Goldman Sachs IPOs reveal some interesting issues. Both deals occurred in 1999 and involved very large, prominent companies. Furthermore, the non-managing syndicate in the UPS IPO includes 24 of the 116 non-managing underwriters in the Goldman offering, allowing a comparison of the relative prestige of these banks across the two IPOs. Table II provides the names, commitment level, and bracket for each of these 24 underwriters.

<<Insert Table II about here>>

Comparing the two deals, there are five banks that appear in the major bracket of the UPS deal and four of these banks (A.G. Edwards, BancBoston Robertson Stevens, Edward D. Jones, and Lazard Freres) also appear in the major bracket in the Goldman IPO; however, the remaining bank (Blaylock & Partners) is located in the second submajor bracket (i.e., the third of the four brackets) of the Goldman deal. Thus, all five banks are judged to be equally prestigious in the UPS offering, but have differential prestige as measured by the Goldman offering. Similarly, an examination of the 19 banks in the first submajor bracket of the UPS offering shows that four are in the major bracket of the Goldman Sachs IPO, six in the first submajor bracket, seven in the second submajor bracket, and two in the third submajor bracket.

The bottom bracket in the Goldman Sachs offering is composed of six e-brokers (counting Charles Schwab as an e-broker). Rigid adherence to the Carter-Manaster approach would suggest that these six have lower prestige than the 110 brokers in the higher brackets. However, two of them also participated in the UPS IPO in the first submajor bracket, thereby indicating prestige equivalent to the other banks in that bracket. Interestingly, one of the six apparently low prestige e-brokers in the Goldman IPO is GS-Online LLC, a subsidiary of Goldman Sachs.

The most striking conflict between these two offerings concerns the intransitivity caused by the positioning of Blaylock & Partners. As mentioned, this bank is in the second submajor bracket in the Goldman offering (the next-to-last bracket), but is in the major bracket in the UPS offering. There are 10 banks in the UPS submajor bracket (Muriel Siebert, Nesbitt Burns, RBC Dominion, Utendahl, Gruntal, J.C. Bradford, Ramirez, Scott & Stringfellow, Tucker Anthony Cleary Gull, and Wachovia) that have a higher rank than Blaylock in the Goldman offering. In other words, these 10 banks have strictly lower prestige than Blaylock & Partners in the UPS offering, but have strictly higher prestige based on the Goldman offering.

Thus, based on just these two IPOs, we observe a large number of ranking ambiguities. If inconsistencies are a relatively common occurrence (as our example suggests), then the Carter-Manaster system will break down. The particular rankings produced would depend on which IPOs were examined. Furthermore, if only a relatively limited number of tombstones are examined to determine the Carter-Manaster ranks, then inconsistencies may not be discovered. Unlike previous studies, we examine essentially every IPO over an extended period of time, so we detect any and all instances of inconsistencies.

Many recent studies use ranks supplied by Loughran and Ritter (2004), which, although based on the Carter and Manaster (1990) approach, also include substantial subjective ranking by the authors. Loughran and Ritter specifically use the Goldman Sachs IPO as a starting point in their rankings. However, an examination of the underwriting brackets in the Goldman IPO prospectus reveals dozens of inconsistencies with their final ranks. For instance, Table II presents the Loughran and Ritter (2004) Carter-Manaster ranks for the 24 underwriters participating in both the UPS and Goldman Sachs IPO. As is clear, underwriters in each of the four brackets do not have the same ranks. In addition, several underwriters in lower brackets have rankings higher than underwriters in the upper bracket (e.g., Edward D. Jones, in the major

bracket, has a ranking of 6, while Morgan Keegan, in the second submajor bracket, has a ranking of 7).

Note that these inconsistencies do not mean that Loughran and Ritter's ranks are inaccurate or incorrect. In fact, as we show later, their subjective rankings have a high correlation with our ELO ranks. Instead, what our example illustrates is that if their rankings do accurately capture relative prestige, then upsets are a common occurrence, and the assumption of a rigid hierarchy among underwriters, which is critically important for the Carter-Manaster system, must be discarded.

Loughran and Ritter (2004) point out another issue with the Carter-Manaster system that occurs when an underwriter participates only in IPOs in which all of the underwriters are low prestige, e.g., penny stock offerings. By exclusively appearing in a top bracket in such offerings over a particular time period, a low-prestige underwriter can garner a relatively high Carter-Manaster ranking. For example, D.H. Blair received a ranking of 8, the second highest, in Carter, Dark, and Singh (1998), but D.H. Blair is clearly a low-prestige, penny stock underwriter. In fact, D.H. Blair received a more appropriate ranking of 2 in Carter and Manaster (1990), thereby highlighting the problem with such banks.

As mentioned, the Carter-Manaster system only considers members of the non-managing syndicate. In the past, these members had an important selling and underwriting function. However, as discussed above, and in more detail in Section III, there has been a notable change in recent years with the bookrunner and co-managers taking over primary responsibility for the underwriting and selling of the offering. This raises the possibility that a bank's relative position in the managing syndicate can reveal information about prestige, particularly in more recent years. That is, if underwriters "aggressively defend their place in the hierarchy" of the non-

managing syndicate, as argued by Carter and Manaster (1990), then it is likely that they will also be concerned about their placement in the managing syndicate.

Within the domestic managing syndicate of the UPS IPO (Table I), there are three levels of managers (i.e., the book manager and two levels of co-managers). Morgan Stanley preserves its top billing as the bookrunning manager by underwriting 13,499,562 shares. Goldman Sachs and Merrill Lynch appear next with 13,449,561 shares (exactly one share less than Morgan Stanley), followed by Credit Suisse First Boston, Salomon Smith Barney, and Warburg Dillon Read with 6,723,772. If the share allocations in the managing syndicate, and associated placement on the tombstone, reveal relative prestige, then Goldman Sachs and Merrill Lynch are more prestigious than Credit Suisse First Boston, Salomon Smith Barney, and Warburg Dillon Read. It could be argued that Morgan Stanley is the most prestigious of all of the six managers. However, since the issuing firm selects the bookrunner, its top position on the tombstone might not reveal its relative prestige with respect to the other participating banks.

One last concern with Carter-Manaster ranks as they are used in practice is a potential look-ahead bias. This potential exists because the ranks are formed by analyzing a large number of tombstones (or prospecti) over time. Researchers who use the ranks to study IPOs that occur within the formation period may implicitly be using information from future IPOs.[8] A similar issue exists with subjective rankings. For example, Loughran and Ritter (2004) retrospectively assign low ranks to certain penny stock underwriters based on the fact that they were ultimately sanctioned by the SEC. As a practical matter, such a bias seems virtually inevitable with subjective rankings.

[8] A look-ahead bias is not an inherent problem with the Carter-Manaster approach as the ranks could be regularly updated such that only prior IPOs are ever considered by researchers.

B. Megginson-Weiss (1991) ranks

Compared to Carter-Manaster ranks, Megginson-Weiss (1991) ranks have some advantages and disadvantages. First, because a bank's Megginson-Weiss rank is based strictly on market share, the ranks are relatively simple to compute and update. The resulting market share numbers are fully cardinal and, with the exception of rare ties, will unambiguously rank all banks that have a non-zero market share.

A potential drawback to Megginson-Weiss ranks is that they rely on the implicit assumption that prestige and market share are equivalent, which may not be true. It is certainly not true in many other industries. In automobile manufacturing, for example, General Motors has the largest market share in the U.S., but it is not viewed as the most prestigious automaker. In the underwriting industry, it may be that some smaller banks are highly selective and specialized, but nonetheless viewed as very prestigious.

Another issue is that relative prestige presumably does not change abruptly, at least not in most cases, but relative market share numbers can vary quite a lot due to, among other things, the presence of a few very large deals and/or the absence of a large number of offerings. For example, as reported by Thomson Financial's SDC league tables, Goldman Sachs and Morgan Stanley were the top two underwriters in 2001 with market shares of 27.4 percent and 19.8 percent respectively. By 2003, the market shares of Goldman Sachs and Morgan Stanley had dropped to only 5.7 percent and 2.8 percent respectively. If market share is used as an indicator of prestige, then it would appear that both of these banks suffered a significant decline in prestige.

Finally, a substantial percentage of all banks will have a market share of zero. This could occur for low-prestige banks and also for more high-prestige banks in a slow market. In addition,

new entrants into the market will also have a zero market share until they complete their first deal.[9] Megginson-Weiss ranks cannot discriminate between these possibilities.

III. Data

We collect data on shares underwritten in equity IPOs over the period 1986-2002. At least initially, we do not exclude any particular types of IPOs. Over the period 1993-2002, we use Thomson Financial's SDC database. For 1990-1998, we backfill (and, in some case, infill) SDC data with data from archival copies of the Compact Disclosure database, which is the predecessor to SDC.[10] Finally, for 1986-1993, we hand-collect (from paper copies and microfiche) prospectus data on 638 IPOs (the paper and microfiche databases we use do not contain every IPO).[11] Our initial sample, prior to cleaning, covers 8,192 IPOs.

A. Data corrections

Errors are not uncommon in our data sources, and we use several screens to identify problems. First, we check whether the shares underwritten sum to the total shares offered. When there is a mismatch, we directly inspect the prospectus either on EDGAR or on our microfiche/paper copies when possible and make any necessary corrections. In the remaining cases, we inspect the shares allocated across different underwriters in the underwriting syndicate. If the mistake appears obvious (as it often does), we correct it. Such corrections are mostly cases in which a single underwriter appears to have a unique share allocation due to a data entry error. For example, the wrong number of zeroes is sometimes entered, such that the shares allocated is too high or low by a multiple of 10. When the error is not obvious, we discard the IPO.

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[9] For example, when two banks merge, the reputation of the newly created entity will obviously be some composite of the merging institutions. However, the newly created organization's market share will not accurately reflect its prestige for at least a finite time period after the merger.

[10] We thank Chad Zutter for alerting us to the existence of the Compact Disclosure data and Thomson Financial for granting us permission to use the data in this study.

[11] We thank Richard Carter, Richard Pettway, and Harjeet Bharbra for allowing us access to their paper and microfiche collections.

A second type of error occurs when a managing syndicate member is incorrectly listed as a member of the non-managing syndicate and vice versa. We test for such cases using several screens. First, we examine all instances in which a member of the managing syndicate (as reported by one of the databases) has the same number of shares underwritten as any member of the non-managing syndicate. We then inspect cases where the number of managing underwriters is large (within a given subperiod) relative to the total number of participating banks. For example, we would inspect an IPO if 20 banks participated in the offering, with one identified as the book underwriter, and the remaining 19 banks listed as co-managers. As in our first pass, we check actual prospecti where possible. When we could not obtain the prospectus, we made corrections that were obvious and discard IPOs for which we were unable to discern the error with a relatively high degree of certainty. We ultimately eliminated 2,855 IPOs because of irresolvable data problems and our final, cleaned sample contains 5,337 IPOs.[12]

The next issue we face concerns underwriter names. In our cleaned sample, there are 4,788 distinct names. However, in many cases, distinct names are created by relatively obvious variations in punctuation, spelling, and/or capitalization. For example, AG Edwards & Sons, Inc. and A.G. Edwards & Sons, Inc. are the same bank, but are not seen as such in a literal computerized comparison of string variables. Also, abbreviations are inconsistently used, e.g., "& Co." versus "and Company," and outright spelling errors occur. In cases where it seems relatively clear that the same bank is involved (e.g. Goldman Sachs & Co and Goldman, Sachs & Co.), we create a single name. Because of the large number of possible differences, we performed this assignment by hand. There is necessarily some judgment in this process, and we elected to err on the side of caution. We specifically did not combine banks in which potentially

[12] Most of the 2,855 discarded IPOs are from the earliest years of our sample period when prospectus information is not available. As we are still in the process of using the procedures described above to clean the data, we anticipate adding to our sample size.

significant organizational changes occurred. So, for example, Salomon Brothers, Smith Barney, and Salomon Smith Barney remain distinct in our database. We also did not combine international divisions with domestic divisions. Our final sample contains data on 2,352 underwriters.

B. Summary statistics

Table III presents summary statistics for our sample of 5,337 IPOs. Results are presented for the entire sample period, 1986-2002, and for four approximately equal length subperiods, 1986-1990, 1991-1994, 1995-1998, and 1999-2002. Coverage is somewhat limited in the 1986-1990 period, as only 444 of the total of 2,040 IPOs are included in our sample. However, coverage is higher in the other three subperiods. Overall, our sample includes 65 percent of all IPOs during the period covered by our study.

<<Insert Table III about here>>

Mean offer proceeds (unadjusted for inflation) increased throughout our sample period, beginning at $24.74 million per IPO and increasing to $149.13 million in the 1999-2002 period. At the same time, the mean number of participating banks decreased from 39.51 per IPO to only 15.94 per IPO. As noted in Bradley, Jordan, and Ritter (2003) and Corwin and Schultz (2004), the size and importance of managing syndicates have grown dramatically, particularly in recent years. Our results confirm their observations. In the 1986-1990 period, the book and domestic co-managers were responsible for underwriting 53.96 percent of the total shares issued, with the bulk of the remaining shares underwritten by the domestic non-managing syndicate. By the 1999-2002 period, 83.46 percent of total shares were underwritten by the book and domestic co-managers. While the number of domestic co-managers has increased, from 0.67 to 2.91 per IPO, the number of domestic non-managers has decreased (from 37.11 to 11.68). Moreover, the percentage of IPOs with at least 40 non-managing domestic underwriters decreased from 47.7

percent of offerings during 1986-1990 to only 1.0 percent of offerings during the most recent four years (not reported in Table III).

The Carter-Manaster and ELO systems rely on differences in share allocations among the participating underwriters to gauge prestige. In the 1986-1990 period, there were, on average, 1.04 (3.33) levels of share allocations per IPO for domestic managers (non-managers). Consistent with the increased importance of managers, the number of levels increased to 1.76 for domestic managers and decreased to 1.81 for domestic non-managers. Thus, the number of "prestige tiers" have increased for managers and decreased for non-managers over our sample period.

IV. The ELO System

In this section, we provide a brief overview of the ELO system, which was originally devised by Arpad Elo (1979) to rank chess players and continues to be used for that purpose (capitalizing "ELO" is standard usage and serves to distinguish the system from the author). Today, it is used to rank many types of athletes, athletic teams, and other competitors. For example, in recent years, it has become popular as a means to rank contestants in multiplayer online "deathmatch" games (also known as "frag-fests").

A. The ELO system

The idea behind the ELO system can be illustrated simply. Assume the outcome in a contest between two players is based on a draw from a normal distribution. The mean of this distribution represents the expected outcome, and the variance is the dispersion in the actual outcome relative to expected. The higher (or lower, depending on the game) the mean, the better is one player deemed relative to the other. Assuming that the players are ordered such that the mean of the outcomes distribution is positive, then the probability of a positive value is the probability that

the better player will win (assuming a game in which the higher score wins). The probability of a negative value is the probability of an upset.

Of course, the outcomes distributions are unknown. Instead, we observe actual outcomes. Suppose after a large number of matches between two players, one player has a winning percentage of 97.5 percent. Obviously, this player is much better, but, given our assumptions, we can make an additional observation. The empirical winning percentage implies that the outcomes distribution takes on a positive value 97.5 percent of the time. If a normally distributed random variable takes on positive values 97.5 percent of the time, we can infer that the mean is 1.96 standard deviations above zero (think of a two-tailed significance test at the 5 percent level). Thus, the difference in expected performance in this case is 1.96 standard deviations.

To implement the ELO system, the outcomes distributions between pairs of players generally is assumed to have different means, but identical standard deviations. With this assumption, a ranking system is straightforward to create. We initially assume that all players have equal abilities (this implies that the mean of the outcomes distribution is zero) and arbitrarily choose a value for the standard deviation of the outcomes distribution. (For ease of interpretation, we set the initial rating for each player at zero and choose a value of one for the standard deviation.) Based on winning percentages from competitions between pairs of players, we then calculate ratings by adding and subtracting the appropriate number of standard deviations. Note that it is not necessary for every player to play every other. If there is a chain of contests, however long, that connects every pair of players, we can rank all players relative to each other. The resulting rating scale is an interval scale, such as a temperature scale or a von Neumann-Morgenstern utility function, so the ratings are uniquely defined up to a positive, affine transformation.

Some additional steps are needed to implement the ELO system for the purpose of ranking banks, which we illustrate next. In the system, players are awarded 1 point for a win, ½ point for

a tie, and 0 points for a loss. We score an IPO in a similar way. A bank in a particular bracket ties all the other banks in its bracket. It loses to all banks in higher brackets, and it defeats those in lower brackets. Each IPO is therefore viewed as a round-robin tournament in which each player plays every other one time.

In our analyses, most IPOs will be treated as having two different round-robin tournaments, a competition among the participants in the domestic managing syndicate (excluding the book underwriter) and a separate competition among the participants in the domestic non-managing syndicate. IPOs with an international tranche would have two more competitions, international managers competing against each other and international non-managers competing against each other. For example, in the domestic non-manager portion of the UPS IPO, ABN-Amro (with a 1,000,000-share allocation) only competes against other members of the domestic non-manager syndicate, tying banks with share allocations of 1,000,000-shares, and defeating banks with a 500,000-share allocation. Thus, ABN-Amro plays 37 other banks with 22 wins and 15 ties, for a score of 29.5. Based on 37 possible points (and counting ties as half of a win), ABN-Amro won 79.7 percent of the "non-manager" competitions in the UPS IPO.

The final detail in implementing the ELO system is to incorporate opponent strength. The easiest way to illustrate this process is with a hypothetical example. Suppose there are five banks, Bank A through Bank E. After examining a large number of IPOs, we have the information summarized in Table IV, which shows each bank's "record" in terms of accumulated points against the other four banks. Notice that different banks are involved in differing numbers of IPOs and not all banks play every other bank (Banks C and D are never in an IPO together). The ranking procedure we use is Elo's (1979, pp. 54-56) "method of successive approximations."

<<Insert Table IV about here>>

As mentioned, we initially assign each bank a rating of 0, and we assume that the outcomes distribution has a standard deviation of 1. Examining the data, Bank A's winning percentage of 89.8 suggests that Bank A is 1.271 standard deviations better than its average opponent. We therefore re-estimate Bank A's mean rank as the average of its opponents' strength (initially set at 0), plus 1.271 standard deviations (of 1 each), for a new score of 0 + 1.271 = 1.271. We repeat this step for each bank, thereby producing a new set of estimated ranks. The results to this point are shown in column 6 of Table V.

<<Insert Table V about here>>

The next step is to compute a weighted average opponent rating. For example, for Bank A, we multiply 21 (i.e., the number of encounters between Bank A and Bank B) by Bank B's updated ranking of 0.295. We repeat this multiplication for the other three banks, sum to get the total weighted points, and then divide by the total number of encounters, 108. This produces a weighted average opponent rank of -0.517. The final step is to re-compute Bank A's strength-adjusted rating as -0.517 + 1.271 = 0.754. We repeat these calculations for each bank, with the resulting opponent strength and bank ratings shown in columns 7 and 8, respectively, of Table V.

From here, we iterate to convergence, meaning that we re-compute opponent strength and bank ratings until the numbers change only trivially from one iteration to the next. In this example, only a few iterations are needed. The final numbers are shown in the last two columns of Table V.

The combination of a bank's record and the opponent's strength is seen in this example. Specifically, although Bank C has a relatively low winning percentage (24.3 percent), it has a higher ELO rating that Bank D (which won 54.7 percent of its encounters). The higher ELO rating for Bank C comes from the higher overall quality of its opponents. Bank C's average

opponent's strength is 0.530 (the highest of the five banks), while Bank D's average opponent's strength is only -0.293 (the second lowest of the five banks).

Much has been written about the strengths and weaknesses of the ELO system, and we will not review that literature here. However, we will note a couple of significant advantages relative to Carter-Manaster rankings. First, it is relatively straightforward to implement and update. Second, if prestige is stable, then the rankings based on the ELO ratings will be stable, but rankings can migrate, and intransitivities (i.e., "upsets") are explicitly incorporated. Third, the interval scale is meaningful, and, apart from unlikely ties, banks are uniquely and unambiguously ranked. Finally, because of the way opponent strength is incorporated, it will tend to avoid the "D.H. Blair" problem previously described. Relative to Megginson-Weiss (1991), the ELO rankings have an advantage in that all underwriters that participate in IPOs can be ranked, not just lead underwriters.

B. ELO rankings

In this section, we present ELO rankings for investment banks participating in the IPO market in 1986-2002. As in the example above, we initially assign each bank a rating of 0 and assume the outcomes distribution has a standard deviation of 1. Ratings using the method of successive approximations are then separately calculated for banks based on their participation in managing syndicates (domestic or international) and in non-managing syndicates (domestic or international). As discussed earlier, we exclude the book underwriter(s) from the calculation of the managing syndicate ratings.

To ensure a meaningful ranking, we exclude underwriters with fewer than 100 non-manager competitions. Because there are far fewer total manager competitions, we use a 30 competition cutoff for the manager rankings. Using data from all 5,337 IPOs, we rank a total of 690 banks in the non-managers rankings and 130 banks in the manager rankings. ELO ranking results for the

top 20 and bottom 20 banks, along with each bank's Carter-Manaster ranking (when available), are presented in Table VI (non-manager ranks) and Table VII (manager ranks).[13]

<<Insert Tables VI and VII about here>>

As shown along the first row of Table VI, the top ranked non-manager bank is Wertheim with an ELO rating of 1.322.[14] Wertheim won 87.0 percent of its 2,095 non-manager competitions, competing against opponents with an average ELO rating of 0.198. EF Hutton & Co. follows at #2, with L.F. Rothschild, Unterberg, Towbin Inc. at #3. The effects of the level of competition on the ELO ratings can be seen in the rating of L.F. Rothschild, Unterberg, Towbin. This bank has a slightly greater winning percentage than Wertheim, 87.4 percent, but competed against opponents with a lower ELO rating, 0.172, thereby resulting in a lower rating. Several of the top-rated banks have Carter-Manaster ratings of 9, but, as the winning percentages show, these banks did have some losses. Hence, at some point, they must have appeared below the major bracket and therefore should have a maximum Carter-Manaster rank of 8.

In Table VII, the top bank in the manager rankings is Morgan Stanley, followed by Goldman Sachs' international division (Goldman Sachs International Ltd), and Merrill Lynch. The domestic and international divisions of the top banks are all clustered together near the top of the rankings, suggesting that the international divisions inherit the prestige of their domestic parents. It is also interesting to note that the top banks in the managing rankings are not in the top 20 banks in the non-manager rankings. Specifically, Goldman Sachs is #25, Morgan Stanley is #26, and Merrill Lynch is #27 in the non-manager rankings.

The effect of including opponent strength is clear in the manager rankings. Fleet Securities (at #18) has the third highest winning percentage (67.5 percent), but, on average, they play far

[13] The complete set of rankings, along with rankings for various subsets and subsamples, can be downloaded at www._____.

[14] In 1986, J. Henry Schroder & Co. Ltd. acquired a 50 percent stake in Wertheim, and the name was changed to Wertheim Schroder. In 1994, the remaining 50 percent was acquired Schroder, and the name was changed to Schroder & Co., Inc. The investment banking subsidiary of Schroder & Co., Inc. was acquired by Citigroup in 2000.

weaker competition than the other banks in the top 20. It is also interesting to note that Donaldson Lufkin & Jenrette is a top 20 managing bank, but its subsidiary DLJdirect is the lowest ranked of the managing banks.

Examination of the top 20 and bottom 20 banks indicates that the ELO rankings are positively related to the Carter-Manaster rankings. Specifically, Carter-Manaster ranks for the banks in the top 20 non-manager rankings range from 7 to 9, while banks in the bottom 20 have Carter-Manaster ranks between 2 and 5.5. In the manager ranks, the top 20 banks are primarily banks with a Carter-Manaster rank of 9, while the bottom 20 banks are primarily in the 5 to 7 range. Apparently, only the better banks participate in the managing syndicates, reflected in their relatively high Carter-Manaster ranks.

Correlations between the Carter-Manaster ranks and the non-manager ELO ratings are high (correlation = 0.785, 468 observations), but they are lower when calculated with the manager ELO ranks (correlation = 0.473, 118 observations). The lower correlation with the manager ELO ratings, coupled with the absence of the big three banks (Morgan Stanley, Merrill Lynch, and Goldman Sachs) from the non-managing top 20, suggests that rankings based on the managing syndicate provides additional information on bank prestige not included in the Carter-Manaster rankings.

Figure 2 presents the frequency distribution of the ELO ranks for the non-managing (Panel A) and managing (Panel B) syndicates. In Panel A, there is a relatively clear clustering at the higher ranks. These banks presumably appear in the major (top) bracket and are thus rarely defeated. A less clear grouping exists in the ELO rating range of about 0.1 to 0.75. These banks tend to appear in the first submajor bracket. A large cluster of banks follows in the range of approximately -1.15 to 0.1. This group contains about 70 percent of the sample. The mean ELO

rating in Panel A is -0.29, lower than the zero initially assigned. This downward drift is probably due to the opponent strength adjustment.[15]

<<Insert Figure 2 about here>>

Panel B of Figure 2 shows that the ELO ratings are more tightly clustered when only the managing syndicate is examined. A discernable breakpoint exists at about zero. The banks with positive rankings are those which generally appear in the top bracket of the managing syndicate. About one-half of the banks are packed in a relatively tight range of about -0.50 to zero. These banks appear, at least on occasion, in brackets other than the top.

More than anything, the frequency distributions in Figure 2 suggest that integer-valued prestige ratings such as Carter-Manaster probably ignore significant differences in prestige in some cases and overstate differences in others. In Panel A, for example, the cluster of banks at the higher prestige levels tends to have Carter-Manaster ranks of 8, but, within that group, there is a noticeable range in prestige as measured by the ELO ranks. In contrast, the banks at the lowest ratings levels typically have Carter-Manaster ranks ranging from 2 to 5, but our ELO rankings suggest that there is really relatively little difference in their prestige (or the lack thereof).

C. Prestige migration

The Carter-Manaster (1990) system relies on the existence of a rigid hierarchy among underwriters. In reality, banks can (and do) gain or lose stature over time. Corporate restructurings, new entries, financial success (or failure) and scandal can alter relative prestige within the industry. We label this phenomenon "prestige migration." Table VIII presents some descriptive evidence on this point by examining the top 20 banks (based on the non-managing

[15] Note that ELO ranks illustrated in Figure 2 have no particular *a priori* probability distribution. The observed distribution simply depends on the distribution of ability in the population of competitors.

syndicate) for four subperiods (1986-1990, 1991-1994, 1995-1998, and 1999-2002). Table IX does the same for the managing syndicate ranks. Note that the ELO scores cannot be directly compared across the subperiods because the subperiods are not "connected" in that the rankings within a period only depend on contests within the period (the same problem arises in comparing scores for, e.g., college football teams across seasons).

<<Insert Tables VIII and IX about here>>

In Tables VIII and IX, the banks listed in each subperiod differ. Much of this is due to name changes and acquisitions. Some banks have remarkably steady relative ranks. In Table VIII, for example, Hambrecht and Quist's ranking ranged between 10 and 12 across the four periods. Other banks gain or lose. Industry analysts note that Donaldson, Lufkin & Jenrette (DLJ) grew substantially in stature. This move is apparent in the Table IX manager ranks, which shows that DLJ rises from #20 in 1995-1998 to #8 in 1999-2002.[16]

IV. Conclusions and Directions for Future Research

Prestige and reputation play an important role in many areas of finance, both in theory and practice. These intangible characteristics can be difficult to measure. A primary contribution of this paper is to show how a well-known ranking procedure, the ELO system, can be used to meaningfully and objectively measure relative reputation for essentially all competitors in a market. We focus on investment banks participating in equity IPOs in this paper, but the system can be used in many other areas.

Our particular application of the ELO system to ranking IPO underwriters has a specific advantage over its application to ranking teams in competitive sports. In sports, an underdog can upset a top-seed. In contrast, in the underwriting industry, change is gradual. Issuing firms and

[16] There are no banks that meet the minimum required number of observations (i.e., 30 observations) for the managing syndicate rankings in the 1986-1990 period. Only 18 banks meet the minimum in 1991-1994. Thus, although DLJ was #8 in the 1991-1994 period, the comparison with its ranking in the other two periods (when there are 55 and 79 banks ranked, respectively) is less meaningful.

their book runners form underwriting syndicates through negotiations and after much deliberation. Thus, "upsets" may reflect changes in industry trends rather than a hot streak of an underdog over a short span of time.

This draft of the paper explains the ELO system and provides underwriter rankings based on this system. The next draft, currently in process, will expand significantly on this theme. First, we will expand on our discussion of the evolution and growth of the managing syndicate. We will then provide a detailed comparison of Carter-Manaster (1990) and ELO ranks, focusing on situations in which they differ significantly and also on the question of whether Carter-Manaster ranks are still useful given the modern structure of the managing syndicate. Prestige migration will be studied in greater depth to examine the extent to which banks build or deplete reputational capital and the events that lead to gains or losses. For example, we will examine the effect of mergers and acquisitions to determine if prestige is gained or lost as a result of corporate reorganizations in the banking industry.

A second avenue of exploration concerns the effect of underwriter prestige on IPO valuation. Results from the 1990s conflict with Carter and Manaster's (1990) original findings, and the reason(s) have thus far proved illusive. We will reinvestigate this question using our ELO ranks to see if the results hinge on the way in which reputation is measured. With our database, we also have the ability to construct other measures of reputation. We will, for example, construct overall prestige measures for the managing syndicate (and the entire underwriting syndicate) and explore the effect of these new prestige measures on IPO pricing. Another contribution is that we will present, and implement, a new, computerized algorithm for generating Carter-Manaster ranks, thereby eliminating the need to hand-process information as previous studies have done. Finally, we discuss other areas and questions in finance to which competition-based ranking technologies could be fruitfully applied.

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Table I
The underwriting syndicate of the United Parcel Service IPO

This table presents information on the underwriting of the United Parcel Service initial public offering. Shares underwritten by each investment bank are listed on pages 73-74 of the 424B4 prospectus, dated November 9, 1999. A total of 109,400,000 shares were offered at $50 per share. The domestic portion of the offering was 87,520,000 shares, with the remaining 21,880,000 shares being offered internationally. The domestic managers are listed on the front page of the prospectus. International managers are listed on page 74 of the prospectus.

Panel A: Domestic underwriting

Underwriter name and role	Shares
Book manager	
Morgan Stanley & Co. Incorporated	13,449,562
Co-managers	
Goldman, Sachs & Co.	13,449,561
Merrill Lynch, Pierce, Fenner & Smith Inc.	13,449,561
Credit Suisse First Boston Corporation	6,723,772
Salomon Smith Barney Inc.	6,723,772
Warburg Dillon Read LLC	6,723,772
Non-managers	
ABN-Amro Incorporated	1,000,000
Banc of America Securities LLC	1,000,000
BancBoston Robertson Stephens Inc.	1,000,000
Bear, Stearns & Co. Inc.	1,000,000
Blaylock & Partners, L.P.	1,000,000
Deutsche Bank Securities Inc.	1,000,000
Donaldson, Lufkin & Jenrette Securities Corp.	1,000,000
A.G. Edwards & Sons, Inc.	1,000,000
First Union Securities, Inc.	1,000,000
ING Barings LLC	1,000,000
Edward D. Jones & Co., L.P.	1,000,000
Lazard Freres & Co. LLC	1,000,000
Lehman Brothers Inc.	1,000,000
J.P. Morgan Securities Inc.	1,000,000
PaineWebber Incorporated	1,000,000
Prudential Securities Incorporated	1,000,000
Sanford C. Bernstein & Co., Inc.	500,000
J.C. Bradford & Co.	500,000
Chatsworth Securities LLC	500,000
E* Offering Corp.	500,000
Gruntal & Co., L.L.C.	500,000
Guzman & Company	500,000
J.J.B. Hilliard, W.L. Lyons, Inc.	500,000
Jackson Securities Incorporated	500,000
Legg Mason Wood Walker, Incorporated	500,000
Melvin Securities, L.L.C.	500,000
Morgan Keegan & Company, Inc.	500,000
Nesbitt Burns Securities Inc.	500,000
Ramirez & Co., Inc.	500,000
RBC Dominion Securities Inc.	500,000
The Robinson-Humphrey Company, LLC	500,000
Charles Schwab & Co., Inc.	500,000
Scott & Stringfellow, Inc.	500,000
Muriel Siebert & Co., Inc.	500,000
Tucker Anthony Cleary Gull	500,000
Utendahl Capital Partners, L.P.	500,000
Wachovia Securities, Inc.	500,000
The Williams Capital Group, L.P.	500,000
Total	87,520,000

Panel B: International underwriting

Underwriter name and role	Shares
Co-managers	
Morgan Stanley & Co. International Limited	4,506,892
Goldman Sachs International	4,506,892
Merrill Lynch International	4,506,892
Credit Suisse First Boston (Europe) Limited	2,253,108
Salomon Brothers International Limited	2,253,108
UBS AG, acting through its division Warburg Dillon Read	2,253,108
Non-managers	
ABN-AMRO Rothschild	200,000
Banca D'Intermediazione Mobiliare IMI S.P.A.	200,000
BBV Interactivos, S.A., S.V.B.	200,000
Commerzbank Aktiengesellschaft	200,000
Credit Agricole Indosuez	200,000
HSBC Investment Bank plc	200,000
Kleinwort Benson Securities Limited	200,000
Tokyo Mitsubishi International plc	200,000
Total	21,880,000

Table II
A comparison of the underwriting syndicates of the United Parcel Service and Goldman Sachs IPOs

This table presents information for 24 underwriters that participated in the domestic non-managing syndicates of the United Parcel Service and Goldman Sachs IPOs. A total of 38 and 116, respectively, non-managing underwriters participated in the domestic portions of the United Parcel Service and Goldman Sachs IPOs, with 24 underwriters participating in both IPOs. Carter-Manaster rankings are from Loughran and Ritter (2004), with -99 indicating a missing ranking. Shares underwritten by each investment bank for the United Parcel Service IPO are listed on pages 73-74 of the 424B4 prospectus (dated November 9, 1999) and on pages 157-160 of the 424B4 prospectus (dated May 3, 1999) for the Goldman Sachs IPO. The major bracket is composed of the set of underwriters with the greatest share allocation among the non-managing underwriters. Following the major bracket is the first submajor bracket (submajor-1), second submajor bracket (submajor-2), and so on.

		United Parcel Service		Goldman Sachs	
Underwriter name	CM rating	Shares	Bracket	Shares	Bracket
A.G. Edwards & Sons, Inc.	7	1,000,000	Major	340,400	Major
BancBoston Robertson Stephens Inc.	8	1,000,000	Major	340,400	Major
Edward D. Jones & Co., L.P.	6	1,000,000	Major	340,400	Major
Lazard Freres & Co. LLC	9	1,000,000	Major	340,400	Major
Blaylock & Partners, L.P.	5	1,000,000	Major	124,200	Submajor - 2
Muriel Siebert & Co., Inc.	-99	500,000	Submajor - 1	340,400	Major
Nesbitt Burns Securities Inc.	7	500,000	Submajor - 1	340,400	Major
RBC Dominion Securities Inc.	7	500,000	Submajor - 1	340,400	Major
Utendahl Capital Partners, L.P.	6	500,000	Submajor - 1	340,400	Major
Gruntal & Co., L.L.C.	5	500,000	Submajor - 1	317,400	Submajor - 1
J.C. Bradford & Co.	7	500,000	Submajor - 1	317,400	Submajor - 1
Ramirez & Co., Inc.	-99	500,000	Submajor - 1	317,400	Submajor - 1
Scott & Stringfellow, Inc.	6	500,000	Submajor - 1	317,400	Submajor - 1
Tucker Anthony Cleary Gull	5	500,000	Submajor - 1	317,400	Submajor - 1
Wachovia Securities, Inc.	7	500,000	Submajor - 1	317,400	Submajor - 1
Chatsworth Securities LLC	-99	500,000	Submajor - 1	124,200	Submajor - 2
Guzman & Company	-99	500,000	Submajor - 1	124,200	Submajor - 2
J.J.B. Hilliard, W.L. Lyons, Inc.	5	500,000	Submajor - 1	124,200	Submajor - 2
Jackson Securities Incorporated	-99	500,000	Submajor - 1	124,200	Submajor - 2
Morgan Keegan & Company, Inc.	7	500,000	Submajor - 1	124,200	Submajor - 2
The Robinson-Humphrey Company, LLC	6	500,000	Submajor - 1	124,200	Submajor - 2
The Williams Capital Group, L.P.	-99	500,000	Submajor - 1	124,200	Submajor - 2
Charles Schwab & Co., Inc.	8	500,000	Submajor - 1	57,500	Submajor - 3
E* Offering Corp.	7	500,000	Submajor - 1	57,500	Submajor - 3

Table III
Descriptive statistics

This table presents descriptive statistics for our sample of IPOs for the entire sample period and four sub-periods. The first line gives the total number of IPOs in Thomson Financial's SDC database, with the second line showing the number of IPOs in our sample. Means are given for the remaining variables. Offer proceeds is the gross proceeds of the offering in millions of dollars. Total participants is the number of banks participating in the underwriting of the IPO. The participant's role indicates the role the bank serves on the IPO, either as the book runner, domestic co-manager, domestic non-manager, international co-manager, and international non-manager. Means are presented for each participant role for the number of participants, the percentage of total shares underwritten by participants in that role, and the number of levels (i.e., the number of different share allocations, or brackets, within that participant role). Data are gathered from Thomson Financial's SDC database, Compact Disclosure, and from final registration statements filed with the SEC for IPOs from 1986 to 2002.

	1986-1990	1991-1994	1995-1998	1999-2002	All IPOs
Total IPOs	2,040	2,464	2,474	1,214	8,192
Sample IPOs	444	1,685	2,097	1,111	5,337
Offer proceeds ($millions)	24.74	42.31	65.83	149.13	72.33
Total participants	39.51	26.98	17.95	15.94	22.18
Participant role:					
Book					
Number of participants	1.00	1.03	1.02	1.08	1.04
Percentage of shares	40.27	41.06	42.65	40.85	41.18
Number of levels	1.00	1.03	1.02	1.01	1.02
Domestic co-manager					
Number of participants	0.67	0.88	1.36	2.91	1.47
Percentage of shares	13.69	19.38	29.42	42.61	27.68
Number of levels	1.04	1.05	1.16	1.76	1.28
Domestic non-manager					
Number of participants	37.11	23.96	14.89	11.68	18.93
Percentage of shares	44.64	36.81	27.02	15.48	29.17
Number of levels	3.33	2.79	2.07	1.81	2.34
Intl. co-manager					
Number of participants	0.14	0.36	0.33	0.21	0.30
Percentage of shares	1.02	2.17	1.64	0.91	1.60
Number of levels	1.29	1.22	1.58	2.44	1.48
Intl. non-manager					
Number of participants	0.59	0.75	0.34	0.06	0.43
Percentage of shares	0.38	0.58	0.29	0.15	0.36
Number of levels	1.03	1.10	1.22	1.44	1.15

Table IV
Example of the ELO system

This table is a hypothetical example that illustrates the scoring used by the ELO system for ranking investment banks. The table summarizes the results of 5 banks and 200 encounters between these banks. Each IPO generates N(N-1) encounters, where N is the number of banks competing. The entries in the body of the table are a bank's record against another bank. A bank "wins" and receives 1 point if it is in a higher tombstone bracket than another on a particular IPO. It "ties" another bank and receives ½ point if it is in the same bracket (i.e., a tie is treated as half a win and half a loss). A bank "loses" and receives zero points if it is in a lower bracket. Points from wins / ties are recorded horizontally and ties / losses vertically. For example, Banks A and B appeared on 15.5 + 5.5 = 21 IPO tombstones together with Bank A recording 15.5 points from wins and ties and 5.5 points from ties and losses.

Bank	A	B	C	D	E	Wins	Win %
A	0	15.5	40	16.5	25	97	89.8%
B	5.5	0	10.5	9.5	17	42.5	61.6
C	5	5.5	0	0	6.5	17	24.3
D	0.5	2.5	0	0	32	35	54.7
E	0	3	2.5	3	0	8.5	9.6
Losses:	11	26.5	53	29	80.5	200	
Encounters:	108	69	70	64	89		

Table V
Method of successive approximations

This table illustrates the calculation of ELO ratings using the data in Table IV. The procedure is based on Elo's (1979) "method of successive approximations." Each bank is assigned an arbitrarily chosen initial rating of 0 and the outcomes distribution standard deviation is chosen to be equal to 1. Based on the standard normal distribution, Bank A's winning percentage of 89.8 percent suggests that it is 1.271 standard deviations better than its average opponent (each having an initial ranking of 0), resulting in a ratings difference of σ x 1 = 1.271 (column 4). We therefore reestimate Bank A's rating as its ratings difference, 1.271, plus its average opponent's rating, 0 (column 5), arriving at a new rating score of 1.271. We repeat this step for each bank, thereby producing a new set of estimated ratings. The results to this point appear in column 6. Next, each bank's weighted (by the number of encounters) average opponent strength is computed using the ratings in column 6, and these numbers are shown in column 7. In column 8, each bank's rating is recomputed as its ratings difference (column 4) plus the weighted opponent strength (column 7). These last two steps (calculation of ratings and opponent strength) are repeated until the numbers converge. The final results are shown columns 9 and 10.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Bank	Wins	Games	Winning percent	Rating difference	Initial opponent strength	Initial strength-adjusted rating	Iteration 1 opponent strength	Iteration 1 strength-adjusted rating	Final opponent strength	Final strength-adjusted rating
A	97.0	108	89.8%	1.271	0.000	1.271	-0.517	0.754	-0.306	0.965
B	42.5	69	61.6%	0.295	0.000	0.295	-0.133	0.162	-0.087	0.208
C	17.0	70	24.3%	-0.697	0.000	-0.697	0.716	0.019	0.530	-0.167
D	35.0	64	54.7%	0.118	0.000	0.118	-0.322	-0.204	-0.293	-0.175
E	8.5	89	9.6%	-1.308	0.000	-1.308	0.399	-0.908	0.232	-1.075

Table VI
Non-manager ELO ratings

This table presents the ELO ratings for the top 20 and bottom 20 banks based on underwriting share allocations among non-managers. A minimum of 100 observations (i.e., encounters) is required to be included in the rankings. A total of 690 banks met this criterion. Ranking (column 1) is based on the bank's ELO rating (column 4). The winning percent is the frequency of wins. The winning percent is calculated by assigning a 1 to a win, 0.5 to a tie, and 0 to a loss, then dividing by the total number of encounters. Opponent rating is the weighted (by number of encounters) average non-manager ELO rating of the bank's opponents. Ratings are compiled using data from IPOs across the entire sample period (1986-2002). Carter-Manaster rankings are from Loughran and Ritter (2004), with a value of -99 indicating a missing ranking.

Panel A: Top 20 banks

Rank	Name	CM rating	ELO rating	Winning percent	Opponent rating	Observ.
1	Wertheim	8.83	1.322	87.0%	0.198	2095
2	EF Hutton & Co Inc	8	1.317	86.4%	0.218	5990
3	L.F. Rothschild, Unterberg, Towbin, Inc.	7	1.315	87.4%	0.172	4377
4	L.F. Rothschild & Co. Incorporated	-99	1.302	86.5%	0.199	2908
5	Robertson, Colman & Stephens	8.75	1.302	86.1%	0.217	6039
6	Drexel Burnham Lambert	8	1.298	85.8%	0.229	8214
7	Shearson Lehman Brothers	9	1.284	85.4%	0.230	6128
8	Shearson Lehman Hutton	9	1.267	84.2%	0.266	3506
9	Smith Barney, Harris Upham	8	1.237	83.9%	0.249	23425
10	First Boston Corp	9	1.233	83.9%	0.242	23510
11	Prudential-Bache Securities	8	1.220	84.1%	0.224	35106
12	Kidder Peabody & Co Inc	8	1.217	83.6%	0.238	29801
13	Wertheim Schroder	8	1.213	83.4%	0.242	26896
14	Dillon, Read & Co Inc	8	1.206	83.5%	0.233	35587
15	Lazard Freres & Co.	9	1.205	83.3%	0.239	28161
16	Dean Witter Reynolds Inc	8	1.203	83.0%	0.249	35503
17	Montgomery Securities	8	1.196	83.4%	0.226	38994
18	Salomon Brothers	9	1.194	82.8%	0.246	33502
19	Alex Brown & Sons Inc	8	1.187	83.4%	0.216	44958
20	PaineWebber Incorporated	8	1.186	83.0%	0.233	43884

Panel B: Bottom 20 banks

Rank	Name	CM rating	ELO rating	Winning percent	Opponent rating	Observ.
671	Drake & Co	4	-1.251	23.6%	-0.533	377
672	Mathews, Holmquist & Assoc.	3	-1.277	31.1%	-0.783	111
673	Linsco Private Ledger Financial Services Inc	-99	-1.278	8.6%	0.087	151
674	AIMCO Securities Company, Inc.	-99	-1.282	31.0%	-0.785	155
675	Hefren-Tillotson, Inc.	-99	-1.298	17.7%	-0.372	158
676	Rocky Mountain Securities	2	-1.303	29.6%	-0.765	220
677	Greenway Capital Corporation	2	-1.312	30.8%	-0.810	104
678	Alan Bush Brokerage Co.	4	-1.313	7.9%	0.100	247
679	Saperston Financial Group	-99	-1.323	21.0%	-0.517	169
680	Yaeger Securities, Inc.	-99	-1.342	30.4%	-0.827	229
681	M.S. Farrell & Company, Inc.	-99	-1.350	23.7%	-0.636	158
682	Aspen Capital Group, Inc.	-99	-1.360	27.2%	-0.753	127
683	Cenpac Securities	2	-1.361	31.0%	-0.866	195
684	William Securities Group, Inc.	5.17	-1.367	9.2%	-0.039	179
685	McClees Investments	2	-1.371	20.8%	-0.558	120
686	Blackstock	5.5	-1.413	8.5%	-0.042	141
687	P. Oppenheimer & Associates Inc.	-99	-1.472	10.2%	-0.198	133
688	La Jolla Securities	3	-1.488	25.2%	-0.820	109
689	T.J. Ransey & Sons, Inc.	-99	-1.498	8.5%	-0.177	159
690	TriQuest Financial Inc	-99	-1.696	6.9%	-0.307	144

Table VII
Manager ELO ratings

This table presents the ELO ratings for the top 20 and bottom 20 banks based on the bank's underwriting share allocation among managers. A minimum of 30 observations (i.e., encounters) is required to be included in the rankings. A total of 130 banks have at least 30 observations. Ranking (column 1) is based on the bank's ELO rating (column 4). The winning percent is the frequency of wins. The winning percent is calculated by assigning a 1 to a win, 0.5 to a tie, and 0 to a loss, then dividing by the total number of encounters. Opponent rating is the weighted (by number of encounters) average non-manager ELO rating of the bank's opponents. Ratings are compiled using data from IPOs across the entire sample period (1986-2002). Carter-Manaster rankings are from Loughran and Ritter (2004), with a value of -99 indicating a missing ranking.

Panel A: Top 20 banks

Rank	Name	CM rating	ELO rating	Winning percent	Opponent rating	Observ.
1	Morgan Stanley	9	0.558	67.9%	0.092	477
2	Goldman Sachs International Ltd	9	0.516	65.1%	0.128	357
3	Merrill Lynch & Co Inc	9	0.497	68.4%	0.017	757
4	Goldman Sachs & Co	9	0.443	64.7%	0.066	320
5	Morgan Stanley Dean Witter	9	0.364	65.8%	-0.043	79
6	Morgan Stanley International	9	0.333	61.1%	0.052	230
7	Merrill Lynch International	9	0.322	58.1%	0.118	161
8	Credit Suisse First Boston	9	0.320	61.0%	0.041	606
9	Swiss Bank Corporation	-99	0.298	60.0%	0.044	45
10	Allen & Co Inc	4	0.290	58.8%	0.068	40
11	Dean Witter Capital Markets-International Ltd	8	0.262	51.6%	0.222	32
12	Lehman Brothers International	9	0.218	54.7%	0.099	138
13	Lazard Freres & Co.	9	0.211	56.3%	0.054	56
14	Lazard Brothers & Co Ltd	9	0.192	51.5%	0.156	34
15	Smith Barney Shearson	8	0.186	51.7%	0.145	30
16	Salomon Smith Barney	9	0.163	60.8%	-0.110	362
17	Dean Witter Reynolds Inc	8	0.162	53.0%	0.087	67
18	Fleet Securities	7	0.157	67.5%	-0.297	100
19	Prudential Securities International	8	0.152	49.0%	0.179	48
20	Donaldson Lufkin & Jenrette	9	0.152	54.8%	0.030	621

Panel B: Bottom 20 banks

Rank	Name	CM rating	ELO rating	Winning percent	Opponent rating	Observ.
111	William Blair & Co	7	-0.568	34.4%	-0.168	122
112	TD Waterhouse Securities	-99	-0.568	38.8%	-0.283	49
113	US Bancorp Piper Jaffray	7	-0.574	43.7%	-0.415	175
114	Volpe Brown Whelan & Co	7	-0.628	46.7%	-0.544	60
115	ING	7	-0.639	36.8%	-0.300	34
116	Volpe, Welty & Company	7	-0.649	30.7%	-0.143	31
117	Crowell Weedon & Co	6	-0.698	32.9%	-0.255	79
118	Needham & Co Inc	5	-0.713	35.2%	-0.331	64
119	Deutsche Bank AG	9	-0.738	35.9%	-0.378	32
120	Wit Soundview Group Inc	7	-0.816	33.6%	-0.392	67
121	Friedman Billings Ramsey & Co	5	-0.833	30.4%	-0.321	46
122	Soundview Technology	7	-0.872	33.8%	-0.454	34
123	FAC/Equities	2	-0.883	35.9%	-0.523	32
124	Blaylock & Partners	5	-0.891	20.9%	-0.083	43
125	Adams, Harkness & Hill, Inc.	5	-1.012	26.9%	-0.396	39
126	Stephens Inc	7	-1.028	23.8%	-0.313	40
127	Fidelity Bank	7	-1.143	20.8%	-0.331	72
128	E*Offering Corp	7	-1.493	12.2%	-0.328	41
129	Wit Capital Group Inc	7	-1.578	7.5%	-0.140	73
130	DLJdirect Inc.	8	-2.184	2.5%	-0.232	118

Table VIII
Non-manager ELO ranks by period

This table presents the ELO ratings for the top 20 banks based on the bank's underwriting share allocation among non-managers. A minimum of 100 observations (i.e., encounters) is required to be included in the rankings. Ranking is based on the bank's ELO rating. Rankings are presented for the periods 1986-1990 (Panel A), 1991-1994 (Panel B), 1995-1998 (Panel C), and 1999-2002 (Panel D). A total of 324, 326, 334, and 255 banks are ranked, respectively, across the four periods.

Panel A: 1986-1990

Rank	Name	ELO rating
1	EF Hutton & Co Inc	1.344
2	Wertheim	1.341
3	Robertson, Colman & Stephens	1.341
4	L.F. Rothschild, Unterberg, Towbin, Inc.	1.339
5	Prudential-Bache Securities	1.334
6	PaineWebber Incorporated	1.333
7	Prudential Securities Inc	1.330
8	L.F. Rothschild & Co. Incorporated	1.330
9	Lazard Freres & Co.	1.329
10	Drexel Burnham Lambert	1.328
11	Donaldson Lufkin & Jenrette	1.327
12	Hambrecht & Quist	1.326
13	Shearson Lehman Brothers	1.325
14	Morgan Stanley	1.324
15	Kidder Peabody & Co Inc	1.324
16	Dean Witter Reynolds Inc	1.323
17	Smith Barney, Harris Upham	1.322
18	Salomon Brothers	1.320
19	Merrill Lynch & Co Inc	1.320
20	Montgomery Securities	1.320

Panel B: 1991-1994

Rank	Name	ELO rating
1	Shearson Lehman Brothers	1.195
2	Shearson Lehman Hutton	1.191
3	Prudential Securities Inc	1.180
4	Smith Barney, Harris Upham	1.173
5	First Boston Corp	1.173
6	Prudential-Bache Securities	1.166
7	Dillon, Read & Co Inc	1.164
8	Robertson Stephens & Co	1.162
9	Alex Brown & Sons Inc	1.160
10	Hambrecht & Quist	1.159
11	Dean Witter Reynolds Inc	1.159
12	Wertheim Schroder	1.159
13	PaineWebber Incorporated	1.159
14	Lazard Freres & Co.	1.157
15	Donaldson Lufkin & Jenrette	1.157
16	Bear Stearns & Co Inc	1.157
17	Montgomery Securities	1.156
18	Lehman Brothers	1.154
19	Salomon Brothers	1.153
20	Goldman Sachs & Co	1.153

Panel C: 1995-1998

Rank	Name	ELO rating
1	Chicago Dearborn	1.115
2	Prudential-Bache Securities	1.110
3	Wertheim Schroder	1.110
4	Montgomery Securities	1.100
5	CHEMICAL BANK	1.099
6	Robertson Stephens & Co	1.098
7	Dillon, Read & Co Inc	1.097
8	Oppenheimer & Co Inc	1.094
9	Dean Witter Reynolds Inc	1.092
10	Alex Brown & Sons Inc	1.092
11	S.G. Warburg & Co. Inc.	1.092
12	Hambrecht & Quist	1.091
13	Deutsche Bank AG	1.091
14	Schroders	1.090
15	Donaldson Lufkin & Jenrette	1.089
16	A. G. Edwards & Sons, Inc.	1.087
17	PaineWebber Incorporated	1.086
18	Lehman Brothers	1.085
19	Salomon Brothers	1.084
20	Bear Stearns & Co Inc	1.082

Panel D: 1999-2002

Rank	Name	ELO rating
1	CIBC Oppenheimer	1.204
2	BT Alex Brown Inc	1.124
3	Lazard Houses	1.114
4	Goldman Sachs & Co	1.089
5	Schroder & Co Inc	1.055
6	Morgan Stanley Dean Witter	1.050
7	BancBoston Robertson Stephens	1.046
8	Credit Suisse First Boston	1.044
9	Salomon Smith Barney	1.042
10	Hambrecht & Quist	1.041
11	Morgan Stanley	1.041
12	ING Baring Furman Selz LLC	1.037
13	NationsBanc Montgomery Sec	1.036
14	Merrill Lynch & Co Inc	1.035
15	Donaldson Lufkin & Jenrette	1.035
16	Deutsche Banc Alex Brown	1.035
17	Lazard Freres & Co.	1.033
18	Bear Stearns & Co Inc	1.032
19	Lehman Brothers	1.029
20	Warburg Dillon Read Inc	1.026

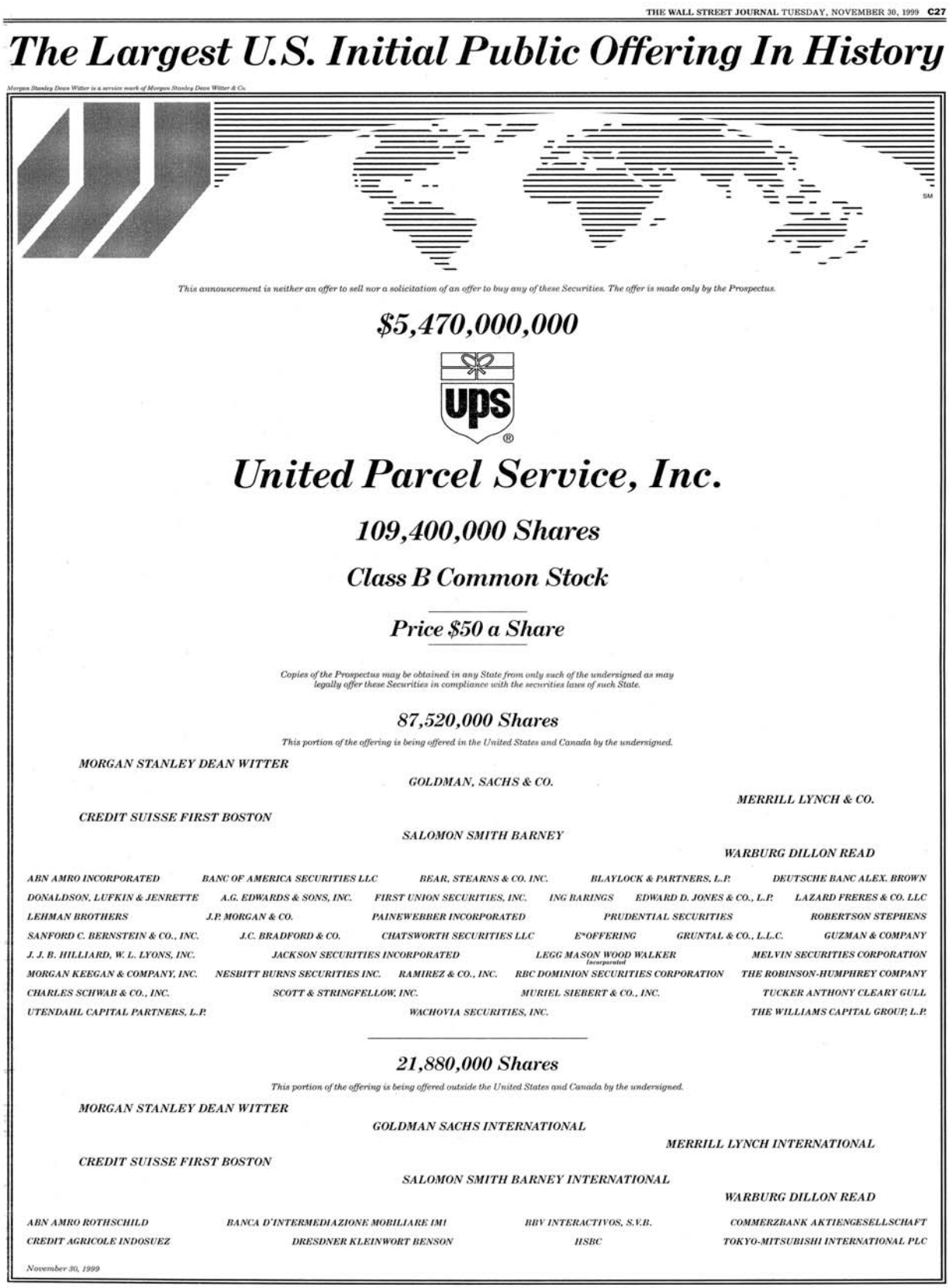
Table IX
Manager ELO ranks by period

This table presents the ELO ratings for the top 20 banks based on the bank's underwriting share allocation among managers. A minimum of 30 observations (i.e., encounters) is required to be included in the rankings. Ranking is based on the bank's ELO rating. Rankings are presented for the periods 1986-1990 (Panel A), 1991-1994 (Panel B), 1995-1998 (Panel C), and 1999-2002 (Panel D). A total of 0, 18, 55, and 79 banks are ranked, respectively, across the four periods.

	Panel A: 1986-1990		Panel B: 1991-1994	
Rank	Name	ELO rating	Name	ELO rating
1	N / A	N / A	Goldman Sachs International Ltd	0.346
2			Merrill Lynch International	0.122
3			Morgan Stanley International	0.116
4			Kidder Peabody Int'l Plc	0.006
5			Lehman Brothers International	-0.027
6			Morgan Stanley	-0.058
7			PaineWebber International	-0.077
8			Donaldson Lufkin & Jenrette	-0.091
9			Smith Barney, Harris Upham	-0.100
10			Salomon Brothers International	-0.110
11			PaineWebber Incorporated	-0.115
12			S.G. Warburg & Co. Inc.	-0.127
13			Credit Suisse First Boston	-0.129
14			Alex Brown & Sons Inc	-0.141
15			Lehman Brothers	-0.160
16			J P Morgan & Co	-0.222
17			Merrill Lynch & Co Inc	-0.264
18			Salomon Brothers	-0.338
19				
20				

	Panel C: 1995-1998		Panel D: 1999-2002	
Rank	Name	ELO rating	Name	ELO rating
1	Morgan Stanley Dean Witter	0.412	Morgan Stanley	0.948
2	Lehman Brothers International	0.394	Goldman Sachs International Ltd	0.946
3	Allen & Co Inc	0.340	Merrill Lynch & Co Inc	0.722
4	Morgan Stanley	0.330	Goldman Sachs & Co	0.616
5	Goldman Sachs & Co	0.320	Credit Suisse First Boston	0.612
6	Merrill Lynch & Co Inc	0.290	Salomon Brothers	0.579
7	Goldman Sachs International Ltd	0.288	Morgan Stanley Dean Witter	0.454
8	Morgan Stanley International	0.192	Donaldson Lufkin & Jenrette	0.359
9	Swiss Bank Corporation	0.187	Salomon Smith Barney	0.266
10	Merrill Lynch International	0.178	J P Morgan & Co	0.263
11	Salomon Brothers International	0.158	Chase Securities Inc	0.252
12	Hambrecht & Quist	0.112	Fleet Securities	0.243
13	ABN-AMRO Rothschild	0.102	Lehman Brothers	0.242
14	PaineWebber Incorporated	0.059	Bear, Stearns International Limited	0.192
15	Credit Suisse First Boston	0.054	BancBoston Robertson Stephens	0.139
16	Smith Barney Inc	0.034	Warburg Dillon Read Inc	0.096
17	Salomon Smith Barney	0.021	Bear Stearns & Co Inc	0.091
18	Lehman Brothers	-0.038	UBS Securities	0.090
19	Dean Witter Reynolds Inc	-0.039	Deutsche Banc Alex Brown	0.064
20	Donaldson Lufkin & Jenrette	-0.042	Hambrecht & Quist	0.041

Figure 1
The tombstone advertisement for the United Parcel Service IPO



The Largest U.S. Initial Public Offering In History

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This announcement is neither an offer to sell nor a solicitation of an offer to buy any of these Securities. The offer is made only by the Prospectus.

$5,470,000,000

ups®

United Parcel Service, Inc.

109,400,000 Shares

Class B Common Stock

Price $50 a Share

Copies of the Prospectus may be obtained in any State from only such of the undersigned as may legally offer these Securities in compliance with the securities laws of such State.

87,520,000 Shares

This portion of the offering is being offered in the United States and Canada by the undersigned.

MORGAN STANLEY DEAN WITTER

GOLDMAN, SACHS & CO.

MERRILL LYNCH & CO.

CREDIT SUISSE FIRST BOSTON

SALOMON SMITH BARNEY

WARBURG DILLON READ

ABN AMRO INCORPORATED | BANC OF AMERICA SECURITIES LLC | BEAR, STEARNS & CO. INC. | BLAYLOCK & PARTNERS, L.P. | DEUTSCHE BANC ALEX. BROWN

DONALDSON, LUFKIN & JENRETTE | A.G. EDWARDS & SONS, INC. | FIRST UNION SECURITIES, INC. | ING BARINGS | EDWARD D. JONES & CO., L.P. | LAZARD FRERES & CO. LLC

LEHMAN BROTHERS | J.P. MORGAN & CO. | PAINEWEBBER INCORPORATED | PRUDENTIAL SECURITIES | ROBERTSON STEPHENS

SANFORD C. BERNSTEIN & CO., INC. | J.C. BRADFORD & CO. | CHATSWORTH SECURITIES LLC | E*OFFERING | GRUNTAL & CO., L.L.C. | GUZMAN & COMPANY

J. J. B. HILLIARD, W. L. LYONS, INC. | JACKSON SECURITIES INCORPORATED | LEGG MASON WOOD WALKER Incorporated | MELVIN SECURITIES CORPORATION

MORGAN KEEGAN & COMPANY, INC. | NESBITT BURNS SECURITIES INC. | RAMIREZ & CO., INC. | RBC DOMINION SECURITIES CORPORATION | THE ROBINSON-HUMPHREY COMPANY

CHARLES SCHWAB & CO., INC. | SCOTT & STRINGFELLOW, INC. | MURIEL SIEBERT & CO., INC. | TUCKER ANTHONY CLEARY GULL

UTENDAHL CAPITAL PARTNERS, L.P. | WACHOVIA SECURITIES, INC. | THE WILLIAMS CAPITAL GROUP, L.P.

21,880,000 Shares

This portion of the offering is being offered outside the United States and Canada by the undersigned.

MORGAN STANLEY DEAN WITTER

GOLDMAN SACHS INTERNATIONAL

MERRILL LYNCH INTERNATIONAL

CREDIT SUISSE FIRST BOSTON

SALOMON SMITH BARNEY INTERNATIONAL

WARBURG DILLON READ

ABN AMRO ROTHSCHILD | BANCA D'INTERMEDIAZIONE MOBILIARE IMI | BBV INTERACTIVOS, S.V.B. | COMMERZBANK AKTIENGESELLSCHAFT

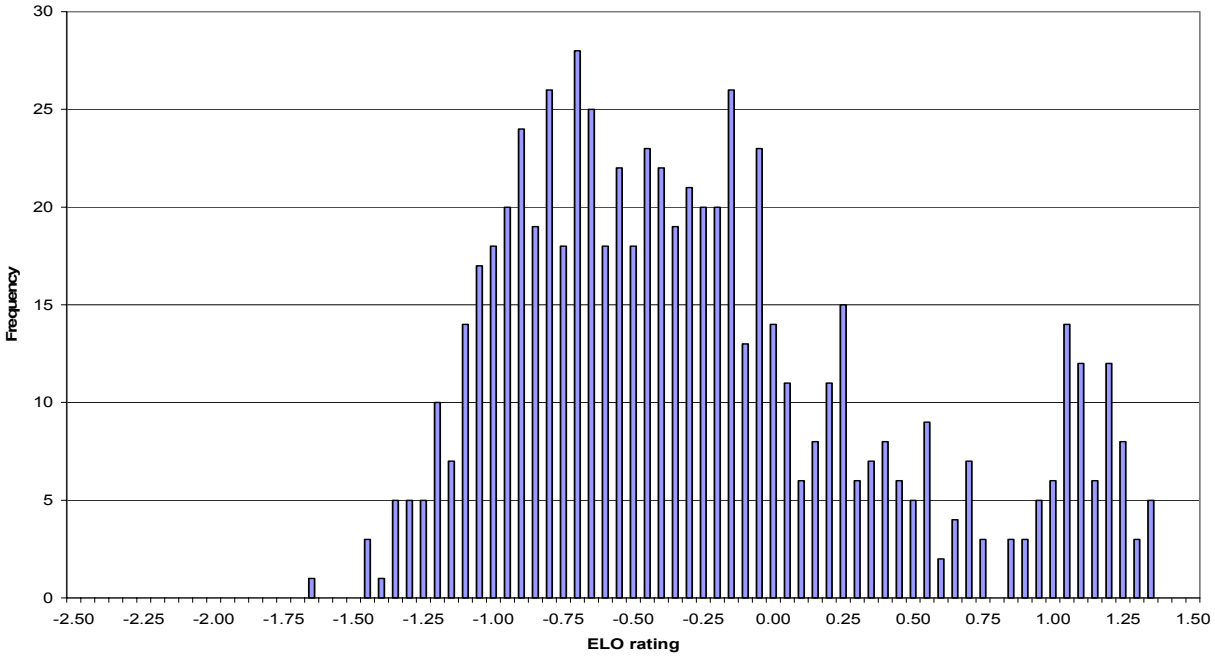
CREDIT AGRICOLE INDOSUEZ | DRESDNER KLEINWORT BENSON | HSBC | TOKYO-MITSUBISHI INTERNATIONAL PLC

November 30, 1999

Figure 2
Frequency distribution of ELO ranks

This figure shows the frequency distribution of ELO ranks based on the underwriting syndicate only (Panel A) and managing syndicate only (Panel B). Only banks with at least 100 (30) encounters are included in Panel A (B) for a total of 690 (130). In Panel A, the mean rank is -0.29; the standard deviation is 0.68. In Panel B, the mean rank is -0.23; the standard deviation is 0.41.

Panel A: Ranks based on the non-managing syndicate only (managing syndicate is excluded):



Panel B: Ranks based on the managing syndicate only (non-managing syndicate is excluded):