CAMBRIDGE ASSOCIATES LLC

TRANSITION MANAGEMENT

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CONTENTS

ABSTRACT

1. Transition management is the process of developing and implementing an optimal strategy to move assets. This includes moving money between managers (within or between asset classes), putting new cash to work, liquidating a portfolio, etc. A successful transition is one achieved at the lowest possible cost with the least possible risk exposure.

2. The cost of unmanaged transitions typically range from 0.8% for large-cap U.S. equity transitions to 4.0% for emerging markets transitions (these numbers are for relatively liquid, index-like assets and will likely be larger for active managers). However, the variability of these costs can be considerable, and so estimates of transition expenses should also include estimates of the standard deviation of the costs, which can range from 0.3 to 4.1 percentage points. More disciplined management of transitions can save up to 75% of the cost and 50% of the risk, depending on the asset class. In other words, *the savings from a well-managed transition may be equivalent to a substantial amount of manager alpha*.

3. There are five components to total cost of a transition: commissions and fees, spread, taxes, market impact, and opportunity cost. Prior to implementing a transition, the first four components can be estimated reasonably well. The opportunity cost, however, is not known until after the transition has occurred and consists of the difference in performance (or tracking error) between the legacy and target portfolios.

4. There is a trade-off between market impact and tracking error over time. As the length of the transition increases, market impact costs decrease, but tracking error increases, increasing the probability of large opportunity costs. This is equivalent to saying that *expected* costs decrease as the length of a transition increases, but risk grows, so that the *actual* cost is likely to be further away from expected cost.

5. In general, control of the assets should be removed from the legacy manager and given either to the new manager or to a transition manager. A transition manager, hired solely to effect the shift in assets, can save costs and reduce risk through lower commissions, ability to cross securities, superior trading expertise, and risk management skills. The transition manager can also reduce operational risk, ease the administrative burden of the changeover, and provide detailed performance reporting on the transition.

6. Transition managers save costs by crossing securities and by charging lower commission rates (50% or more). In addition, they can reduce risk through intelligent concurrent trading of securities and through strategies that use derivatives or exchange-traded funds (ETFs). In addition, transition managers help in planning, execution (e.g., securities settlement), and post-transition analysis, thereby reducing the risk of operational mistakes.

7. There are five ways assets can be moved from one manager to another:

    - **In-Kind Transfers** are simply a movement of assets from the legacy manager to the new manager, avoiding all trading costs (except possibly minor registration or transfer fees).

- **Internal Crossing** is available from index-fund managers. Trades are entered into a crossing system after the market closes and are usually priced at market-on-close of the next day, avoiding commissions, spread, and market impact costs—but incurring relatively high tracking error risk.
- **Public External Crossing** networks (electronic crossing networks or ECNs) where commissions are much lower than open market trade commissions, spread costs are eliminated, and market impact costs greatly reduced.
- **Brokered External Crossing** is the matching of trading flows within a broker-dealer. The crosses may be priced within the spread at the time of the trade, or at a negotiated price. Spread, commission, and market impact costs are generally lower than in an open market transaction.
- **Open Market Transactions** occur on listed exchanges, incur the highest commission costs, and are subject to all other costs.

8. Transitions can be performed on an agency basis, principal basis, or a hybrid of the two. Most transitions are effected on an agency basis with the investor bearing all the risks. In a principal bid, a broker-dealer guarantees the cost of the transition, essentially buying the legacy portfolio and delivering the new portfolio for an agreed upon price. This kind of transition costs more, but has no price risk.

9. Selection criteria for transition managers include (in order of importance):

   - Risk management;
   - Trading expertise;
   - Access to crossing flows;
   - Transition-management experience;
   - Client-reporting capabilities;
   - Client-service capabilities;
   - Administrative support services; and
   - Low explicit costs (commissions and spreads).

10. In general, fixed income portfolio transitions are more difficult than those for equity portfolios. As a result, fixed income portfolios are usually liquidated and the proceeds delivered to the new manager. For liquid fixed income portfolios between $10 million and $25 million a transition manager may have no real advantage over a new manager or custodian unless there are some illiquid positions. For larger portfolios, the trading ability of a broker-dealer may add value through lower market impact and narrower spreads. For extremely illiquid securities, the legacy manager may be the best alternative since this manager knows the brokers or other money managers that buy and sell those particular bonds.

11. When planning a transition, investors should consider the timing. There are many events that dramatically change the liquidity environment for a transition and could therefore affect the choice of transition strategy. These include index rebalancings, end-of-quarter portfolio window-dressing, option expirations, and macroeconomic shocks.

SUMMARY

Introduction

Transition management is the process of developing and implementing an optimal strategy to move assets once allocation decisions have been made. This includes moving money between managers (within or between asset classes), putting new cash to work, liquidating a portfolio, etc. A successful transition is one achieved at the lowest possible cost with the least possible risk exposure and in recent years transition managers' investment in the business has resulted in substantial reductions in their costs and improvement in their risk-management capabilities.

Why is Transition Management Important?

Unmanaged transitions can be quite "expensive." The costs of unmanaged transitions can range from 0.8% for large-cap U.S. equity portfolios to 4.0% for emerging markets portfolios. Even these estimates are for relatively liquid index-like assets and understate the costs when active managers are involved on both sides of the transition. The potential savings from disciplined transition management are therefore considerable. For example, the estimated cost of shifting money from an active mid-cap growth manager to an active mid-cap value manager is 1.1% of the value of the assets, but with a little bad luck on the timing, could cost as much as 2.6%. A well-managed transition should eliminate much of this timing risk, reducing the "poor outcome" cost from 2.6% to only 1.4%, which represents considerable savings. The more complex the transition, the greater the benefit of having a transition manager (although it should be noted that not all transition managers offer the same level of administrative support to smaller investors lacking their own administrative resources).

	Cost Unmanaged (bps)	Possible Cost Savings (%)
U.S. Large-Cap	40	50-75
U.S. Mid-/Small-Cap	55-85	30-60
Global Equities	55-110	30-60
Emerging Markets	200	5-20
Bonds	10-120	0-20

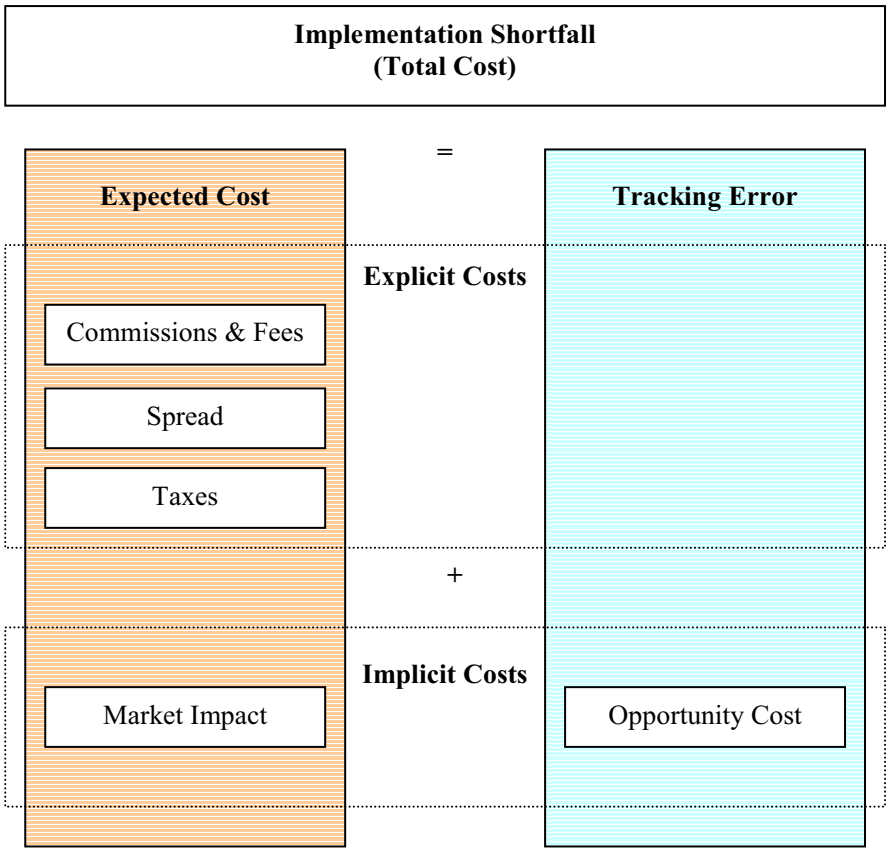
(Subset of the table in Exhibit 2)

Overview of the Total Cost of a Transition

There are two equivalent ways to split up the total cost of a transition:

- Explicit Cost + Implicit Cost = Total Cost
- Expected Cost + Tracking Error = Total Cost

Each method is a different way to categorize the components of cost: commissions, fees, spreads, taxes, market impact, and opportunity cost.



Before a transition occurs, total cost should be thought of as expected cost plus tracking error risk. Opportunity cost is the realized tracking error after the transition has occurred. When analyzing the cost of a transition and evaluating options, investors should therefore think of the cost (expected cost) as a negative return with a certain level of risk (tracking error).

Expected Transition Costs

The predictable costs in a transition consist of commissions, fees (registration/custody/transition), spreads, taxes, and market impact. These costs vary greatly, depending on the nature of the assets being bought and sold. For example, moving assets from one large U.S. equity value manager to another will cost significantly less than moving assets from emerging markets equities into high-yield bonds, due to the float, turnover, volatility, and liquidity of the underlying assets being traded.

Commissions and fees are the per share transaction costs charged for the trading of a security. Miscellaneous fees include custody account and security registration fees. Some transition managers will charge a fee in basis points (bps) instead of a per share commission rate.

The bid-ask spread is the difference in price between sellers and buyers of a security and is wider for less liquid or more volatile securities. On a round trip transaction, the bid-ask spread will be paid to market-makers for providing liquidity. If different types of securities are being bought and sold the spread can be calculated by adding together half of the spread for each type of security.

Taxable investors are obviously subject to taxes on all net gains from assets sold during a transition. Taxes can only be avoided in a transition if the assets are transferred in-kind from the legacy manager to the new manager. If an overlay strategy is used during a transition, gains or losses on derivative contracts, exchange-traded funds (ETFs), and index-fund transactions may be taxed at short-term rates. Some countries also impose stamp taxes on transactions by all investors. For example, the U.K. stamp tax is 0.5% upon change in beneficial ownership in a stock. This will be incurred twice if a stock is sold in one account and bought in another.

Market impact is measured in a variety of ways, but refers to the impact of trading on the price of a security. The basic intuition is that the greater the volume traded relative to total daily trading volume, the greater the likely impact since large-volume sellers (buyers) need to adjust the price down (up) to attract a counterparty to the transaction. The market impact of a large trade of this sort is generally reversed when selling or buying pressure subsides.

Because explicit costs (commissions, spreads, and taxes) are easy to understand and quantify, often too much emphasis is placed on them, while less attention is paid to less readily observed market impact costs (see Exhibit 2 for a breakdown of estimated transition costs for a variety of asset classes).

Transition Risk

By far the most important influence on the total cost is the tracking error risk between the legacy and target portfolios. Frequently, tracking error results in opportunity costs that are greater than all other costs combined. Tracking error is caused by differing characteristics between the legacy and target portfolios; for example, a mismatch of country, industry, asset class, or investment style. Any unmatched factor between portfolios that influences returns will cause tracking error (typically defined as the standard deviation of return between portfolios). During a one-day transition from large-cap value stocks to large-cap growth stocks the tracking error is approximately 0.80%, which means that it can be said with 95% confidence that the cost of tracking error will be between -1.6% and +1.6%. This range is based on the assumption that daily returns are normally distributed. In reality this is not quite true and the range of possible costs is wider. See Exhibit 2 for estimates of the daily tracking error risk between other types of assets.

Tracking error can also be thought of as market timing or a deviation from target/policy exposures. In many transitions the legacy manager will liquidate assets and send cash to be reinvested with the new manager. During this transition, however, the investor's exposure to the asset class in question is reduced, while the exposure to cash is increased. If the market in question rises sharply in the interim, the investor would suffer a significant hit from this under-exposure.

With less liquid securities or very large transactions where the volumes being traded are large relative to daily volume, the transition should be spread out over multiple days. However, tracking error risk increases as the duration of the mismatch between the portfolios increases. Mathematically, risk increases with the square root of time.

Transistion tracking error = $\sigma_{daily}\sqrt{T}$

Or, with an adjustment for continuous trading: transition tracking error = $\sigma_{daily}\sqrt{\frac{T}{3}}$

The risk between the target and legacy portfolios changes dynamically over the life of the transition. In general, the more liquid securities will be transitioned first, leaving a residual portfolio that in all likelihood has greater tracking error to the residual of the target. If improperly managed, this risk can be greater than the risk at the beginning of the transition.

Example:

Time 0:	Tracking error of legacy and target portfolio: **1%** daily σ
Day 1:	50% of portfolio traded
End of day 1:	Tracking error of legacy and target portfolio residuals: 3.5% daily σ
	Daily portfolio σ = 0.5*3.5% = **1.75%** > 1% at time 0

For a two-day transition in the example above, the daily tracking error of the portfolio on the second day, after 50% of the transaction has been completed ($1.75\% * \sqrt{1} = 1.75\%$), is larger than originally predicted for both days ($1\% * \sqrt{2} = 1.41\%$).

The use of derivatives, ETFs, and index funds can reduce tracking error. For example, if an investor is moving from a highly diversified core large-cap equity manager into a government bond portfolio, derivatives could be used to swap the exposures. Costs will be incurred, but the tracking error risk of the trade may be greatly reduced. The usefulness of derivatives, ETFs, and index funds in reducing tracking error risk depends on the ability of these financial instruments to capture risk factors in the legacy and target portfolios. Thus, for example, derivatives may not be available that capture the risks and exposures embedded in the target portfolio in the case of a transition from a large-cap U.S. equity index fund to a concentrated deep value, small-cap manager. The greater the idiosyncratic (non-diversifiable) risk contained in either the target or the legacy portfolio, the less useful hedging with derivatives or ETFs becomes. This is an important concept when examining the later stages of transitions because if the most liquid securities are traded during the first part of the transition, the remainders or "stubs" may contain mostly idiosyncratic exposures.

Most transition managers emphasize another type of risk—operational risk, which involves the risk of errors in coordination, planning, and reconciliation. An example would be the legacy manager depositing cash in the investor's account on a Friday afternoon that cannot be effectively invested until the following Monday. Another example is delayed trading or transfer of assets because securities were not called back from securities lending.

The Relationship Between Cost and Risk

Market impact and tracking error interact over time to influence the total cost of a transition. A longer transition will have lower market impact, but the tradeoff is that tracking error (opportunity cost) increases. The following table illustrates this tradeoff.

Trading Horizon	Market Impact Cost	Opportunity Cost/ Tracking Error
Short	High	Low
Long	Low	High

The easiest way to combine the concepts of cost and risk is to transform risk into a cost, as is done in much of the literature on the subject. As can be seen in Chart 1, the lowest cost of the transition is achieved with approximately a two-day transition. Opportunity cost increases with time and after one day becomes the dominating component of cost. Market impact drops rapidly and, as shown in Chart 1, becomes less important than opportunity cost after one day. The explicit costs of commissions, spreads, and taxes are constant over time, and are typically the smallest part of total cost. Note that the opportunity cost line in the graph is not the actual expected opportunity cost, but only one possible outcome from a probability distribution. The cost will be above the line 17% of the time, and below the line 83% of the time. While intuitively appealing, transforming a risk into a cost implicitly assumes a risk aversion factor (very difficult to quantify or understand). Despite this assumption, this representation does conveys three basic intuitions: (1) explicit costs are most likely the smallest component of total cost; (2) market impact decreases as the time to trade increases; and (3) tracking error risk increases and will become a more important component of total cost as time to trade increases.

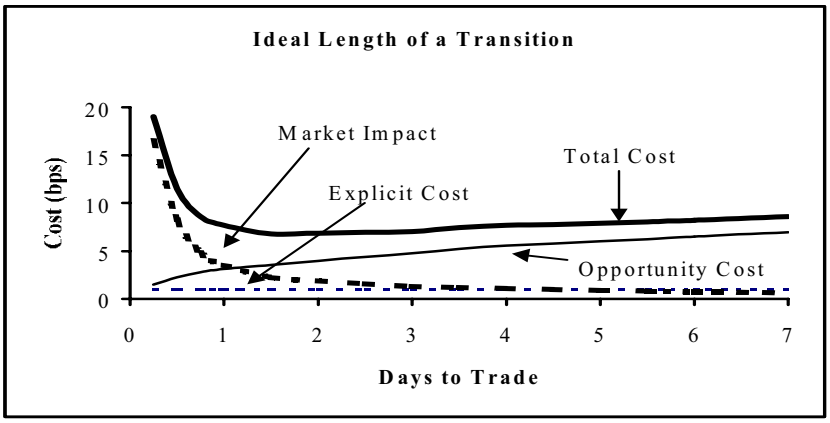


Chart 1

The best way to think of transition options is in terms of the expected cost and risk. Chart 2 shows the distributions of possible costs for two transition options of differing lengths. The solid line represents Transition 1, which occurs over a longer transition period than Transition 2. Because Transition 1 occurs over a longer time period, it has lower expected market impact costs and therefore lower expected total costs. In the graph this can be seen by the expected costs of 10 bps versus 25 bps of Transition 1 and Transition 2, respectively. However the longer transition period for Transition 1 also causes it to have a higher tracking error than Transition 2, 250 bps versus 120 bps. Unlike the first analysis, it is unclear from this chart which length of transition is ideal. In order to choose the correct strategy, risk preferences must be weighed versus the alternative expected costs.

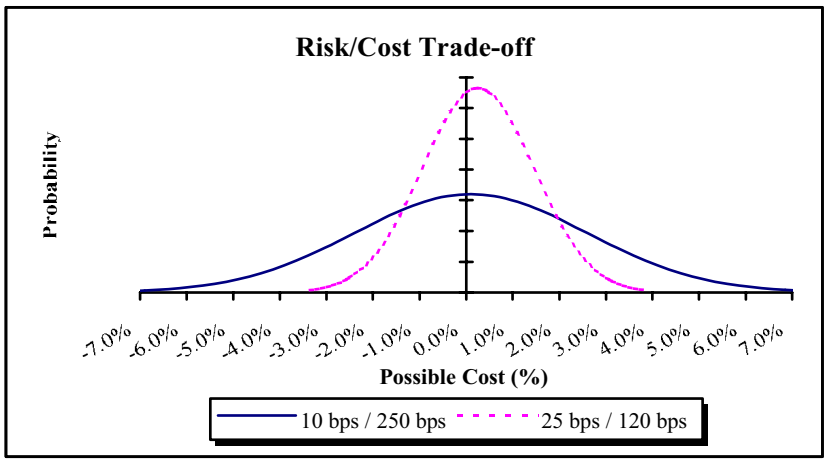


Chart 2

Chart 3 shows another representation of the relationship between expected cost, risk, and time. As the number of days over which the transition occurs increases, the expected cost decreases, but the variation around that cost grows. Chart 3 shows this by plotting the lines that correspond to one standard deviation from the expectation.

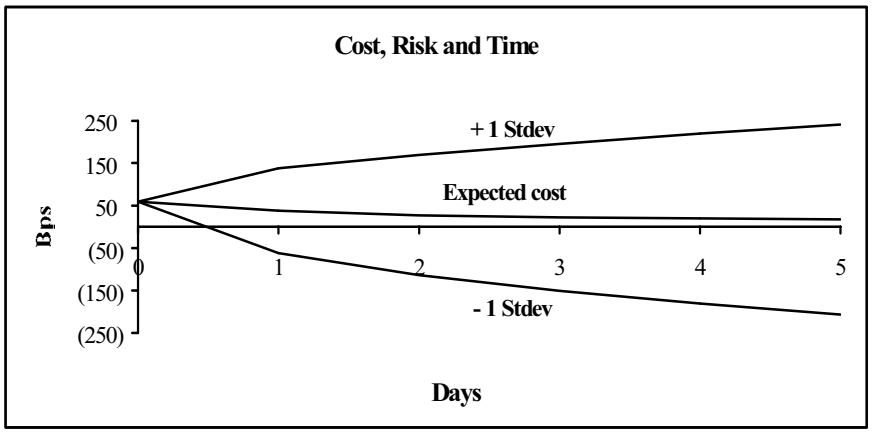


Chart 3

Chart 4 shows a three dimensional perspective of the same issue. As can be seen, as the transition time increases (toward the front of the graph) the distribution of possible costs widens.

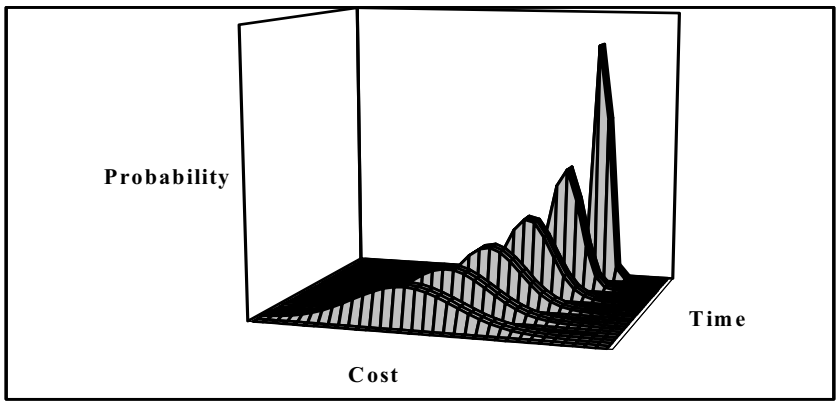


Chart 4

Measuring Success

In order to measure the total cost of a transition, a benchmark must be chosen against which to measure cost.

Possible Benchmark Methods	
Portfolio Benchmarks	Implementation Shortfall Legacy Portfolio
Trading Benchmarks	VWAP (Value weighted average price) OHLC (Average of open, high, low, and close) MOC (Market on close) Prior night's close

Portfolio benchmarks provide a way to measure the total cost of a transition and a metric to determine the level of success. Trading benchmarks give a sense of how well any one trade is performed but are less useful in evaluating the overall success of the transition. Evaluating the level of success of a transition is difficult due to the unique nature of each transition and lack of available data comparing transitions.

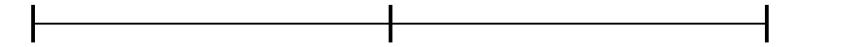
Implementation Shortfall

The best measure of a transition's performance is implementation shortfall,[1] which is the difference between the performance of the benchmark portfolio and the actual performance of the transitioned assets. In other words, it measures the difference in performance between what actually happened and what would have happened if, at the beginning of the transition, the assets were instantly moved into the new portfolio at no cost. Typically, the benchmark is the portfolio to which the assets are being transitioned (target portfolio). For example, for a liquidation of a small-cap U.S. equity portfolio, the target portfolio is cash and the benchmark would be T-bills. For a transition from one active manager to another, the benchmark would be the new manager's wish list (a list of securities accepted in lieu of cash). In the absence of a wish list, the new manager's current portfolio could serve as a proxy. An index can be used as a benchmark, but will not fully capture the risks of the active manager's portfolio. For example, if an investor terminates one diversified small-cap manager and hires another, it would seem intuitive to use a small-cap index such as the Russell 2000® as the transition benchmark. However, the assets are not being transformed into the index but into the new active manager's portfolio, which may have significant tracking error to the index. By using an index, the implementation measure would reflect both the performance of the transition and a mixture of the legacy and new managers' active bets.

Implementation shortfall is measured from the time the transition is begun until it is completed. Alternatively, it can be measured starting from the time that a decision is made to transition assets. However, this option often adds tracking error due to the time delay between when the decision is made and when the transition begins. This delay is caused by uncontrollable external factors such as the time required to fire/hire managers, complete legal documents, and perform other administrative functions.

[1] Perold, Andre. "The Implementation Shortfall: Paper Versus Reality." *The Journal of Portfolio Management*, Spring 1988, pp. 4-9.

Example:



Decision:
Sell $10,000,000 of Manager A
Buy Manager B
Manager A liquidates and sends cash on day 1
Manager B receives and invests cash on day 2
Value of portfolio at end of day 2: $10,300,000
Transitioned portfolio's performance from time 0 until the end of day 2:
10,300,000/10,000,000 = 3%
Manager B's performance from time 0 until end of day 2: 4%
Implementation Shortfall (loss on transition): 4% - 3% = 1%

Legacy Portfolio

The legacy portfolio's performance is a measure of what would have happened if the transition had not been undertaken. If the legacy portfolio significantly underperforms the target portfolio during the transition and then subsequently outperforms soon after the transition is over, this might indicate that the transition manager was too aggressive, causing excessive temporary price impact (sells push down legacy portfolio prices and buys inflate target portfolio prices). A less aggressive strategy may have avoided some of the temporary price impact.

Trading Benchmarks

Trading benchmarks focus on intra-day trading. These include value weighted average price (VWAP), average of open, high, low, close (OHLC), market-on-close (MOC), and prior-night's close. VWAP and prior-night's close are the most commonly used. A problem associated with trading benchmarks is the potential for manipulation by traders. For example, VWAP can be manipulated by trading 15% to 20% of the daily volume and MOC can be manipulated with only 5% of daily volume. In general, for larger, more liquid stocks, VWAP is considered to be the best all-around benchmark for measuring intra-day skill since it serves as a reasonable proxy for the performance of a passive trader who trades with the flow throughout the day. For smaller or less liquid stocks, the size of the trade approaches the daily volume, and the trade becomes VWAP. In this case, prior-night's close is considered a better benchmark, as it captures the market impact of a trade that is a significant portion or all of the daily trading in a position. MOC is a particularly poor benchmark, as a trader can affect prices by buying or selling into the close, exposing the investor to potential front running by the trader.[2]

It is difficult to determine whether a transition manager has performed well. As a measure of a manager's success, implementation shortfall is too broad because it captures unavoidable market movement. VWAP and other trading

[2] "VWAP Strategies," by Ananth Madhavan, Institutional Investor, *Transaction Performance: The Changing Face of Trading*, Spring 2002, pp. 32-39 provides a good non-technical discussion on trading benchmarks.

benchmarks are not understood well by non-traders and only look at intra-day trades, ignoring the impact of decisions relating to trading over multiple days. Transition manager evaluation will be discussed at greater length in a later section.

Summary of Analytic Framework

Whether or not a transition manager is used, all transitions fit within the analytical framework presented here. To summarize:

- Implementation shortfall is the sum of all costs during a transition and the best measure of total transition performance.
- To calculate implementation shortfall an appropriate benchmark must be chosen.
- For each transition an expected implementation shortfall and tracking error can be estimated.
- Understanding the tradeoff between expected shortfall and risk is critical to an optimal transition.

The following table compares and summarizes two transitions using this framework.

Summary of Cost and Risk in Two Transition Options

	Expected Shortfall (bps)	Tracking Error - σ (bps)
Option A	34	+/- 160
Option B	36	+/- 100

Breakdown of Expected Implementation Shortfall

	Explicit Costs (bps)	Market Impact (bps)	Total Expected Shortfall (bps)
Option A	6	28	34
Option B	12	24	36

Expected cost and tracking error risk can be calculated for any transition. Expected cost is calculated by adding together the spread, the market impact, and the commissions of both managers' asset classes. The tracking error is calculated by multiplying the daily tracking error by the square root of the number of days over which the transition will occur. Estimates of costs and of daily tracking error can be found in the chart in Exhibit 2.

Example:

Sell mid-cap U.S. equity growth manager
Buy large-cap global ex U.S. equity manager
Assume: mid-cap manager delivers cash on day 1
global ex U.S. manager invests on day 2
Cost to liquidate mid-cap = 55 bps
Cost to purchase global ex U.S. = 55 bps
Daily risk between mid-growth and global ex U.S. large = 1.48%
Expected cost = 55 + 55 = 110 bps
Risk = 2 x (1.48% x $\sqrt{2}$) = 4.2%
95% confidence the cost will be between 5.3% and -3.1%

(See Exhibit 6 for a sample pre-trade report that could be used to compare transition options.)

Transition Implementation: Moving the Assets

There are five ways an asset can be moved from one portfolio to another:

- In-kind transfers;
- Internal crossing;
- Public external crossing;
- Brokered external crossing; and
- Open-market transaction.

These categories cause endless confusion because there are two types of external crossing, with variation in terminology usage between vendors.

External Crossing Types

- Electronic Crossing Network (ECN)
- Brokered

The following table breaks down the various ways in which terminology may be used.

	Non-Broker-Dealer	Broker-Dealer
In-Kind	In-Kind or Match	Match (Internal) Cross
Internal Cross	Internal Cross	N/A
External Cross ECN	External Cross Open Market	Open Market
External Cross Brokered	Open Market	Open Market External Cross
Open Market	Open Market	Open Market

In-Kind Transfers are simply a movement of assets from the legacy manager to the new. This ensures that a stock is not sold and repurchased again, incurring unnecessary trading costs. ***Avoids:*** all trading costs (except possibly minor registration or transfer fees).

Internal Crossing is available from index-fund managers. The cross occurs either with index-fund assets flows or transition-management flows from other clients. Index managers have received an exemption from the Department of Labor (DOL) that allows them to cross securities with flows from passively managed assets if they do not charge a commission. These trades do not have to be reported to any exchange and are completely anonymous. Index providers perform the crossing with different methodologies. For example, one manager enters the trades into a crossing system after the market closes and securities are crossed at MOC prices the next day, while another manager crosses transition-management flows in the morning at market-on-open prices and enters index crossing flows midday to be crossed at MOC the same day. (Index managers cross their index asset flows at MOC because it keeps tracking error on their index funds low.) For all index managers, index flows are highly concentrated on two days of the month: a mid-month day and the last day of the month, with most flows concentrated on the latter. ***Avoids:*** commissions, spread, and market impact costs.

ECN External Crossing refers to crossing performed through ECNs, which are electronic exchanges where the commissions are lower than those on the open market. The crosses are priced at the midpoint of the spread at the time of the trade, eliminating payment of the spread. Examples of ECNs include POSIT, Instinet, Island (bought by Instinet in 2002), Archipelago, Bloomberg Trade Book, and BRUT. Trading is anonymous, resulting in information leakage only from trading volumes and not from participant identity. There are many variations of how the cross occurs, including live trading, timed auctions throughout the day, and overnight crossing. ***Avoids:*** spread. ***Lowers:*** commissions and market impact.

Brokered External Crossing refers to the matching of trading flows within a broker-dealer. The liquidity for these crosses comes from large internal flows derived from transition management, program trading, block trading, and other desks at the broker-dealer. The crosses may be priced within the spread at the time of the trade, at VWAP, at market on open or close, or at some other investor-directed price. The broker-dealer has discretion regarding where in the spread to execute the trade; however, many will price at the midpoint of the spread. The brokers execute crosses of internal flow for clients on both sides of the trade based on "best execution" policies. Commissions may be reduced or eliminated, depending on the contract written with the broker-dealer and the size of the transition. A broker-dealer might offer crosses for reduced commissions for relationship reasons, because they can sell the liquidity on the other side for a commission,

or because they can match the trade against risk exposures in their book. Some broker-dealers will cross against transition-management client flows for free, whereas others do not distinguish these flows from normal trading flows. Crossed trades are reported to the exchange after the trade occurs, reducing the market impact. Non-broker-dealer transition managers have access to the crossing opportunities at brokers through their program trading and block desks. In general, the crosses and open market trades are not broken out in the broker-dealers' post-trade reports unless requested. State Street has a unique system called Lattice, which is a hybrid of ECN and brokered crossing. This is included in their totals for external crossing, but these flows are distinct from ECN-type trading. ***Lowers:*** commissions, spread, and market impact.

Open Market Transactions occur on listed exchanges, incur the highest commission costs, and are subject to all other costs.

	Explicit Costs			Implicit Costs		
	Spreads	**Commissions**	**Taxes**	**Market Impact**	**Opportunity Cost**	**Information Leakage**
In-Kind	No	No	No	None	No	None
Internal Crossing	No	No	Yes	None	Yes	None
External Crossing - ECN	No	Yes	Yes	Low	Yes	Low
External Crossing – Brokered	Depends	Yes	Yes	Low	Yes	Medium
Open Market	Yes	Yes	Yes	Yes	Yes	High

Liquidity and Transition Size

The notion of liquidity is the driving force in portfolio transitions. If markets were infinitely liquid there would be no market impact costs. If there were no market impact costs there would be no need to trade over multiple days. If there were no exposure to time, there would be no tracking error. The entire framework presented earlier would become solely about explicit costs. Explicit costs would be lower because market-makers would charge smaller spreads if there were no risk in providing liquidity. During a transition, the majority of cost is a payment for liquidity and liquidity affects each transition differently, depending on the nature of the liquidity in the asset classes that are being traded and the liquidity of the particular securities held.

Thus, the absolute size of a transition is less significant than its effect on market liquidity and therefore on the investor's ability to trade the securities in question. A $5 million portfolio of a few micro-cap stocks is large, relative to the liquidity in the individual names, whereas a $50 million diversified large-cap portfolio is small, relative to the available liquidity. However, examining liquidity for a position can be difficult because average daily trading volume statistics usually include days on which there were news events that caused a large spike in trading volume, making a given security appear more liquid than it actually is on a "normal" day. Moreover, truly average days are actually quite uncommon. For example, the data below indicates an average volume of $9.8 million Dryer's shares traded during April 2002, but there were in fact only two days out of that month's 22 trading days during which volume was close to this "average."

Although it is theoretically easy to estimate the amount of a stock that can be traded without noticeable market impact (a rule of thumb for liquid stocks is 20% to 30% of daily volume), in practice this is more complicated because one can never be quite sure just how much liquidity there might be in a given security on a particular day. For example, the data below indicate that in theory it should have been relatively easy to trade $2 million (20% x $9.8 million) of Dreyer's stock on any given day in April 2002. In fact, there was one day in April where only $2.1 million traded, which would have forced an investor seeking to sell $2 million either to spread the trade over several days or to incur substantial market impact costs.

Dreyer's Grand Ice Cream, Inc. (DRYR) April 2002 Volume	
Avg. Daily Volume (22 days)	$9.8 million
Avg. Daily Volume (without top 5 days)	$7.3 million
High Volume	$30.7 million
Low Volume	$2.1 million
Market Cap	$2.4 billion

Source: Yahoo! Finance – http://quote.yahoo.com

Transition Options

For a standard transition from one manager to another, an investor has five options:

- Legacy manager(s) sells and new manager(s) buys;
- Legacy manager(s) sells and transition manager buys;
- New manager(s) sells and buys;
- Transition manager sells and new manager(s) buys; and
- Transition manager sells and buys.

The five transactions are a combination of three sell options (legacy manager sells, new manager sells, and transition manager sells) and two buy options (new manager buys and transition manager buys).

Legacy Manager Sells

In general, the control of the assets should be removed from the legacy manager and given either to the new manager or a transition manager.

Disadvantages: Upon a notice of liquidation the manager loses incentive to effectively manage the account and liquidation of assets. Obtaining the best execution may become a secondary priority and, depending on the length of notice required, may lead to large trading costs or improper management of risk exposures. Managers will often pay more

in commissions for a trade and have incentives to do so, as trading provides soft dollars. In general, managers may pay $0.06 a share to trade, whereas a transition manager will typically charge less than $0.03. Managers may be upset at being terminated and do a poor job for political or behavioral reasons. If there are a large number of redemptions at the same time, this could put downward pressure on the positions held and should be factored into the analysis of transition options.

Advantages: The legacy manager knows the positions in their portfolio well and should know how to best trade the assets. In addition, the manager has incentive not to lower the price of their remaining assets under management. Maintaining a good reputation could create incentive for the manager to handle the liquidation prudently, especially if the sale is only a partial liquidation of the position. If the manager is experiencing net inflows, a sale could be accomplished for no cost as the investor selling is bought out by the incoming cash flows.

New Manager Sells

Disadvantages: The new manager might not know how to trade the assets of the legacy manager effectively or may not be equipped to do so, particularly when transitioning between asset classes. As with the legacy manager, trades may be done for higher commission fees than could be accomplished through a transition manager. In addition, allowing the new manager to complete the transition is equivalent to giving the manager a free option on performance. If the assets during the transition outperform the benchmark the manager might wish to claim the performance because it handled the transition well. However if performance is poor, the manager may argue it was the old assets that caused underperformance.

Advantage: The new manager wishes to start the relationship with the investor on the right foot and is given incentive at the beginning of the relationship to handle the transition well.

New Manager Buys

Disadvantages: The new manager may buy the new portfolio too quickly, incurring large impact costs, or not quickly enough, exposing the investor to unwanted opportunity costs. If the new manager is handling the sell as well as the buy, the manager may not be trading to achieve the optimal balance for the investor between cost and risk. This may occur either because the manager does not share the investor's overall view of the transition, or does not have the expertise or systems in place to manage the tradeoff between the cost and risk of the transition. Smaller investment managers are unlikely to have the dedicated staff resources or analytical tools necessary to manage the risk during the transition. The manager has incentive to transition to the new portfolio quickly in order to reduce tracking error to the manager's composite performance. Without being held accountable for implementation shortfall, the manager does not have a strong incentive to minimize overall transition costs.

Advantage: The new manager will know the positions well that are being bought and therefore may best know how to trade into those positions.

Large money managers with portfolios across multiple asset classes may have the resources to deliver good transition management services. Some managers have internal efforts that rival the services that transition managers can provide on both a trading and operational basis. Managers have only recently started to offer these services to clients, and

often investors need to request them. Evaluation of the manager's ability to handle the transition should use the same criteria as the investor would apply to the evaluation of a third-party transition manager.

Transition Manager Buys, Sells or Both

Advantages: Transition managers lower costs, manage transition risks, provide project management and reporting, and reduce operational risks. In general, investment managers will direct trades to brokers for five to seven cents a share, whereas a transition manager will generally charge under three cents a share and often close to one to two cents a share for larger transitions. Besides offering lower commissions rates for open market trading, transition managers can use crossing to reduce commissions, spreads, and market impact. More important than lowering the costs is a transition manager's ability to help investors understand and reduce risks in a transition. This is accomplished by crossing and skilled trade execution. One of the simplest advantages of hiring a transition manager is project management. The transition manager coordinates communications between all parties involved in a transition (custodians, consultants, investor, and managers). The greater the complexity of a transition (hiring and firing of multiple managers across multiple asset classes) the greater this benefit. Transition managers can help ensure that important events occur on time, reducing operational risk (e.g., securities are called back from borrowers). Moreover, after a transition is complete, the transition manager provides reports that help the investor understand the performance impact and overall success of the transition. As noted previously, however, not all transition managers offer the same level of administrative service due to the nature of their business models and staffing levels.

Disadvantages: The transition manager does not know the names they are trading as well as the legacy and new managers. Selecting a transition manager adds another level of work and complexity to the transition process.

Agency Trading versus Principal Trades

For transitions done on an agency basis, the transition manager acts to its best ability to ensure a smooth transition, but does not risk any of its own capital—this risk falls entirely on the investor. In a principal bid, on the other hand, the broker-dealer guarantees the cost of the transition, buying the legacy portfolio and delivering the new portfolio for an agreed upon price that will depend on the characteristics of the portfolios. However, a principal trade will typically have a higher cost than the expected cost in an agency transition. Principal trade prices that can be agreed to include VWAP, prior-night's close, MOC, or some derivative thereof. Principal bids may or may not be blind and for a blind bid, the investor sends the broker-dealer portfolio characteristics instead of actual holdings. Depending on the investor's risk tolerance, a principal bid may be the best option. It is also possible to do a hybrid transition, where part of the portfolio is traded on an agency basis and the remainder is done with a principal bid. This could be appealing because a less liquid piece of the portfolio can be quickly sold off instead of being traded over a few days on an agency basis. Principal bids are rarely used for international equities because the costs are high, reflecting the larger risks inherent in trades across multiple markets.

Crossing versus Open Market Trading

Crossing has both benefits and drawbacks. It is cost effective in that it reduces or eliminates market impact and explicit costs (except taxes). However, it constitutes only one of many tools available to a transition manager and careless crossing can greatly increase the tracking error during a transition, even if the transition occurs over one day in highly liquid U.S. large-cap stocks. In general, the more sensitive an investor is to easily measured costs that directly affect the budget, the greater will be the value of crossing. Because of the increased risk of tracking error, however, crossing should be maximized only if there is a benefit to the investor that outweighs this risk.

The following is an example of the hidden opportunity cost of MOC internal crossing with an index manager. Consider a day on which the S&P 500 drops by 100 bps. Investors selling portfolios with S&P 500-type exposure at closing market prices would lose 1% of the portfolio value as a result of effecting the transaction at closing rather than at opening prices. Similarly, selling on the open market throughout the day would result in a loss of approximately 50 bps. Commissions on the cross would be zero; however, assuming an average share price of $40 and $0.03 a share commissions, for open market trades there would have been an explicit cost of 7.5 bps, which amounts to $15,000 on a $20 million portfolio. At the end of the day, the crossed portfolio would therefore be worth $19,800,000 and the portfolio traded on the open market would be worth $19,885,000, a difference of 42.5 bps (100 bps minus 57.5 bps).

One might point out that the market would have been just as likely to increase 1% as decrease 1%. In this case, trading intra-day would underperform internal crossing by 57.5 bps, or if an investor were buying equities as the other side of the transition, the price of the purchased securities might have also decreased, mitigating some of the impact of the cross. In either case, internal crossing guarantees exposure to at least one day of tracking error between the buy and sell portfolios, whereas an investor can greatly reduce tracking error by trading intra-day. Thus there is a tradeoff between the explicit costs of trading during the day, and the potentially larger tracking error in performing an internal cross.

	Explicit Costs (bps)	Tracking Error (Risk) (bps)
100% Crossing	0	+/- 100
Open Market Sell	7.5	+/- 50

If crossing must be done across multiple days, the tracking error grows with time. The chart below examines a transition between two portfolios that have a 1% tracking error. As can be seen, tracking error increases more quickly for transitions focusing on crossing.

	1 day	2 days	3 days	4 days	5 days
100% Crossing	1.0%	1.4%	1.7%	2.0%	2.2%
Open Market Trade	0.6%	0.8%	1.0%	1.2%	1.3%

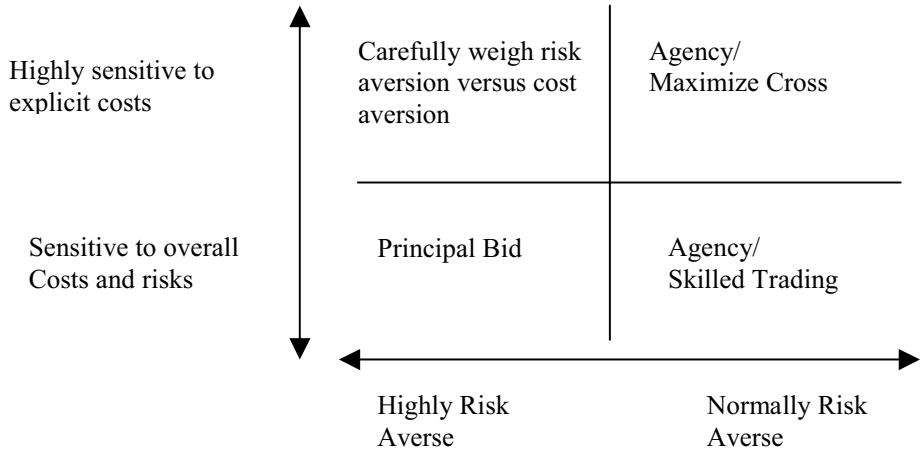
(Tracking error for crossing is $\sigma\sqrt{T}$ whereas for open-market (continuous) trading it is $\sigma\sqrt{T/3}$.)

There is no obvious choice between internal crossing for free or performing the transition with open- market trading. It is worth noting, however, that most open-market traded transitions will take less time. If a cross takes three days and an open-market transition takes one, the difference in tracking error is 1.1% (1.7% minus 0.6%). Taking on an additional 1.1% in random risk, equal to a substantial amount of manager alpha, may not be worth saving a few bps in cost.

Adverse selection is caused when highly liquid securities are traded immediately, leaving a portfolio "stub" that has concentrated, underperforming, or progressively difficult stocks to trade. This may cause excess tracking error and overall implementation shortfall to rise. To some degree this is unavoidable as a transition progresses, but if a transition manager's mandate is to maximize crossing the result may be increased tracking error of this sort. An effective transition manager will control this risk, minimizing sector, style, country, capitalization, and other biases in the portfolio.

Crossing with index funds is supposedly costless because there are no explicit costs. However, when trading with index-fund flows an investor is providing liquidity to the index fund. The fund would normally have to purchase the liquidity from the market that the investor is providing for free. This is advantageous to the index fund because trading on market close for no commission allows them to reduce their tracking error to the index. If the index fund is not able to cross its flows, it still needs to trade on the open market. Therefore in net, if both sides of the cross were instead traded on the open market, there would still be the same level of overall liquidity. The only difference is that explicit costs would be paid by both parties and the side with the greater need for liquidity would have had to pay a market impact cost. Since the index fund has larger flows, it would probably pay the market impact and the transition client would receive the market impact in the form of better prices for providing liquidity. By providing MOC prices to index funds, investors are therefore exposing themselves to intra-day volatility and transacting at a price that has significant value to index-fund managers.

Below is a simple matrix that helps balance the options between principal and agency trades, as well as the level of crossing to target.



Types of Transition Managers

There are two main types of transition managers: liquidity providers and liquidity resellers. The providers of liquidity break down into broker-dealers and index managers. The resellers of liquidity include custodians and third-party transition services. In general, the index managers have a unique source of liquidity—the flows from their index funds—to which broker-dealers and liquidity resellers do not have access.

	Liquidity Providers		Liquidity Resellers	
	Broker-Dealers	**Index Managers**	**Custodians**	**Third Party**
1st tier	Morgan Stanley Goldman Sachs Deutsche Bank	State Street Global Advisors Barclays Global Investors	State Street Bank	LJR (fixed income)
2nd tier	UBS Warburg Citigroup Lehman Brothers Merrill Lynch			
3rd tier	Dresdner Kleinwort Wasserstein Bank of New York LJR - Instinet (equity)		Mellon Northern Trust Bank of New York	
Unknown	JP Morgan			Frank Russell Sec. Donaldson & Co

In theory, all providers should be able to provide agency or principal trading. Transition managers that do not have risk capital can get principal bids from broker-dealers and pass them through to the investor. However, such principal bids will generally be more expensive at non-broker-dealers since there are two levels of fees.

With respect to crossing, index managers will likely have the best crossing opportunities for securities found in their index funds. For portfolios that have many securities outside of indices, the crossing opportunities will likely be higher at broker-dealers. If an index provider is chosen, it is important to note that the majority of fund flows are concentrated on two dates a month, with little flow the rest of the month. It would not make sense to hire an index provider based on crossing ability and then implement a transition on the fifth day of the month.

Transitions of under $50 million are considered relatively small by the large broker-dealers. For transitions under $5 million dollars it will generally not be cost effective to hire a transition manager since typically the assets will be in commingled accounts and even if a slice can be taken of the portfolio, the individual positions will be small. Explicit cost savings will likely be no more than $7,500, and the time and energy spent hiring a transition manager might more effectively be deployed elsewhere. However, in a transaction of small dollar size, strategies to avoid market timing by reducing tracking error are advised.

Transition Constraints

Constraints that prevent an "optimal" transition derive either from the investor or from one of the investment managers. Investor constraints include the ability or willingness to use derivatives, need for liquidity, sensitivity to risk (risk aversion), and the need for anonymity. Legacy manager constraints include lockups and either unwillingness or inability to transfer assets out of commingled accounts. New manager constraints include unwillingness to share a wish list (target portfolio) and unwillingness or inability to accept contributions/funding as non-cash assets.

The **ability or willingness to use derivatives** is important to consider when exploring options to maintain risk exposures. For example, in a transition from a fixed income portfolio to an equity portfolio, an investor might consider using derivatives to swap the remaining debt exposure for equity exposure during the transaction. If the investor is unwilling or unable to use derivatives, tracking-error risk could be reduced by accelerating the pace of the transition.

For a highly **risk sensitive** investor or situation, crossing should be de-emphasized and a transition should be accelerated or effected through a principal bid.

Investors' **need for liquidity** varies: investors seeking to effect a rapid transition should recognize that this may result in substantially higher market impact costs.

The desire for **anonymity** will affect how the transactions can be implemented—crossing offers greater anonymity than open market trading.

Either a legacy manager or a new manager might **be unwilling or unable to transfer assets** except through cash. This will happen most often with commingled accounts or mutual funds. In this case there is no possibility for in-kind or crossing transactions.

Lockups and other **contractual restrictions** are unique by manager and may play a role in either the timing or form of assets obtained from the legacy manager.

In order for a transition manager to perform the buy portion of the transition, there must be a target portfolio. This is only possible if the new manager gives the transition agent a list of stocks the manager is willing to accept in lieu of cash—the **"wish list."** Some managers may be very secretive and not want to provide such a list, in which case the only option is to deliver cash and incur buying costs.

Timing and Liquidity

When considering the timing of a transaction, investors should think about liquidity events that affect large groups of securities. For example, index rebalancings, end of quarter window dressing, and option expirations are all events that can provide liquidity to certain assets (some events can increase tracking-error risk). Delaying the transition by a day or two may be beneficial if the tracking error risk is low in waiting for greater liquidity. In addition, changes in liquidity environments and macroeconomic shocks can dramatically affect transactions. For example, after a crisis, liquidity costs and tracking error for an emerging market will be much greater. Prior pre-trade estimates of expected implementation shortfall and tracking error are likely to be too small relative to the changed environment.

Fixed Income in Transitions

There are a few features of fixed income markets that make transitions more difficult to analyze. The first issue is the **number of different securities** available. A company that has one stock issue might have dozens of bond issues. If two active equity managers are holding IBM stock, it is possible to perform an in-kind transfer of the security during a transition. With fixed income, however, matching securities between bond managers is unlikely even if they have the same style and hold the same companies. For instance IBM has over 40 bonds, all with different durations, convexities, and optionality. The sheer number and lack of uniformity of fixed income issues reduces the potential for transferring securities in-kind.

The second issue relates to the **trading and pricing mechanism** for bonds. There is no central exchange for bonds. Bond liquidity is provided by market makers that charge no commission, but make money by buying and selling at a spread. To understand the decentralized nature of bond pricing, consider that there are over 30 bond dealers in the United States who currently report to the Fed and many others that do not. To find a price for a bond, one must shop around among these dealers to find the best price—the prices quoted in the broker market are just indications of spreads at which bonds are trading, not actual prices. Because of this, establishing a centralized fair market price is currently not possible. Large index providers that cross equities at MOC prices are also permitted by the DOL to cross bonds. However, because centralized market prices do not exist for bonds, they choose not to create prices for crossing purposes. A further complication is that large dealers pass their trading books around the globe to various traders so issues can be traded 24 hours a day.

Both the **size of bond portfolios and positions** are important in transition analysis. Position sizes below $100,000 are much more difficult to liquidate than larger ones. Liquidity is really found only in positions of $500,000 or more and bond portfolios smaller than $10 million to $25 million (depending on the bond types) are considered small by broker-dealers, while portfolios over $100 million are likely to have market impact. Portfolios of $50 million to $100 million might have some market impact, and portfolios under $50 million will likely not affect more liquid bond markets (odd lots cause problems because they need to be sold into retail networks or middle markets). Broker-dealers are compensated for trading based on spreads and for them it is just as much work to complete a $100,000 trade as a $1,000,000 trade, but the fee earned on the spread of the larger position is much larger.

Management of risk exposures during the transition to, from, or between bond portfolios is rapidly changing: interest-rate exposure is relatively easy to manage with Treasury futures, but hedging credit risk is still difficult. Many broker-dealers are now trading bond trusts that give the holders credit exposure, but such initiatives are still very firm specific. Credit derivatives are mainly OTC swaps and would not make sense for most transitions.

Most bond transitions are still liquidations since most new managers prefer to receive cash to buy the particular bond issues they desire. In addition, many bond products tend to be commingled accounts that either do not allow investors to take a slice, or make this undesirable because the resulting portfolio would be filled with hard-to-trade bonds with small par values and odd lot sizes. For portfolios under $10 million, having the new manager or custodian liquidate the portfolio may be the best option for liquid portfolios. Between $10 million and $25 million, a transition manager may have no real advantage over a new manager or custodian unless there are some illiquid positions. For larger portfolios, the

trading ability of a broker-dealer may add value through lower market impact and narrower spreads. For extremely illiquid bonds, the legacy manager may be the best alternative since they are likely to have the best knowledge of the dealers or other money managers who buy and sell those particular bonds.

Should the Transition Manager Act as Fiduciary?

If ERISA law governs the assets in a transition, it is not completely clear whether or not the transition manager should act as a fiduciary. If a broker-dealer is chosen to effect the transition in the United States and is acting as a fiduciary, the firm is by law not allowed to principal trade, (which prevents them from trading bonds, international equities, or OTC derivatives) and would have to perform the trades through another broker-dealer. Since it is likely that the broker-dealer would have been chosen for its ability to trade and its access to internal trading flow, this could be a problem if a significant portion of the transition is in fixed income or international securities. If index providers or third party transition managers are used, there should be no problems with having them fulfill the fiduciary role, since it is likely that they are already directing trades to broker-dealers outside of their firm.

Firing a Manager Without a Replacement

When an investor has occasion to terminate a manager before hiring a replacement, how should the assets be invested?

If the decision is made to fire the manager immediately, there are a few options for maintaining exposure in the asset class. These include letting the portfolio float unmanaged, hiring an interim manager to control risks, going to cash for a period until a new manager is found, entering into derivative contracts, buying ETFs, or purchasing index funds. Which alternative is best will depend on the asset class and the time frame for finding a new manager. Over shorter periods, derivatives are an effective way to control risk and obtain exposures. For moderately sized equity portfolios, ETFs may be the best option for maintaining asset-class exposure, but for transition periods of six months or greater, ETFs generally become more expensive than index funds. Exhibit 7 contains a sample analysis of ETF and index-fund costs of various index providers for a $380 million asset allocation shift.

In the case of an index fund, or a security that tracks an index fund, the primary considerations are fees (management fees and transaction costs), tracking error, and liquidity. Based on these three characteristics, the most efficient method to gain exposure to the global equity markets for medium-term periods is through the use of MSCI EAFE and S&P 500 ETFs, which represent units of ownership in a long-term unit-investment trust designed to track the price performance and dividend yield of the MSCI EAFE and the S&P 500 indices. ETFs are not options or futures; their underlying value derives from ownership of stock. These funds can be created or redeemed at any point, and therefore use this arbitrage mechanism to keep the net asset value of the fund in line with the benchmark.[3]

[3] Please refer to our 2001 report entitled *Exchange-Traded Funds: Versatility at a Price* for a more detailed discussion of the topic.

Advantages

- Convenience and liquidity. Unlike an index mutual fund, investors can buy or sell ETFs just like a stock, at any time of the day, in any amount.
- They are the least expensive way to transition a portfolio over a short time period (three to six months).
- The shares can be used as a "currency" to fund active managers. Active managers generally accept the ETFs, selling them as they increase their equity exposure in the active portfolio. This eliminates the potential of being out of the market while a manager transition takes place.
- Simple administration. Unlike futures, no margin account must be maintained and no quarterly contract rolls must be administered.

Disadvantages

- Over the long term (one year and longer), commingled index funds may be less expensive.
- ETFs can only be used for moderately sized portfolios, given their overall capitalization and daily trading volumes (although S&P and MSCI EAFE ETFs have much greater liquidity than other, more specific ETFs).

Alternatives

Three alternatives include futures contracts, commingled vehicles, and index mutual funds.

- Futures are potentially a cheaper way to gain exposure but require posting of margin collateral and professional management of the quarterly contract expiration. Through proper and skilled execution, ETFs can be equally or more efficient. However, the tracking error is significantly higher for the MSCI EAFE futures replication than the ETF or index fund (approximately 1.50% versus 0.10%, respectively).
- Commingled vehicles are potentially more expensive to establish and would not be appropriate for a short-term allocation (less than six months). Custodial fees and stock commissions are charged directly to the customer, and pricing and access is usually limited to the end of day.
- Conventional retail index mutual funds have very high costs.

There are fewer options for fixed income portfolios. Gaining interest rate exposure using futures is relatively easy to accomplish during a transition, but gaining credit exposure is more difficult. Some broker-dealers have trust products to gain credit exposure and BGI has launched fixed income iShares. For larger accounts, OTC derivative solutions might be available. A complete discussion on creating fixed income exposures is beyond the scope of this report.

Intra-day Transition Risk

People tend to think of transition time in periods of days rather than hours. However, given the intra-day volatility levels of equity markets, the difference between a good transition and a bad one could be determined by whether the transition manager decided to trade over one half day or split the transition over two half days.

Consider a large-cap U.S. equity portfolio evenly split between Microsoft and Coca-Cola, and a mid-cap portfolio split between Apple and Starbucks. A decision is made to move out of the large-cap portfolio and into the mid-cap portfolio. A transition manager is hired and decides to sell Microsoft and buy Starbucks in the morning. In the afternoon the manager decides to sell Coca-Cola and buy Apple. At the end of the day, the transition is over and the portfolio has gone from holding 50/50 Microsoft and Coca-Cola to 50/50 Apple and Starbucks. What is not so obvious is that at midday the portfolio owned 100% beverage companies. If technology stocks had rebounded around the middle of the day, driving up both Apple and Microsoft, the transition portfolio would have underperformed its benchmark because it did not have any technology exposure when the stocks started to rebound. An effective transition manager will attempt to manage this sort of risk effectively.

Creating a Transition Management Plan

There are many steps in a transition, but no one plan is right for every transition. This section provides a four-stage outline that can be modified to fit a particular transition during the planning phase. If a transition manager is used, the time required to search for this manager should be considered in the planning process.

- **Planning and Coordination**

  -Specify a performance benchmark for the transition
  -Analyze portfolio characteristics
  -Analyze market and economic conditions
  -Examine transition options available
  -Identify transition provider well in advance of transition
  -Define responsibilities of all participants and collect contact information
  -Create a calendar
  -Hire and terminate managers
  -Complete operation details such as:
    Obtain certified asset lists and open transition accounts
    Reconcile lists and check that securities are not on loan

- **Create Portfolio Strategy**

  -Define expectations
  -Examine major performance factors such as:
    liquidity, risk exposures, size
  -Weigh cost and risk tradeoffs
  -Develop and weigh alternative trading scenarios such as:
    Duration – Extended/Short
    Crossing – Maximize/Opportunistic
    Timing – Immediate/Opportunistic
  -Create a strategy

- **Strategy Implementation**

  -Match/In-kind securities
  -Cross and Open-market trade
  -Manage portfolio risks

- **Implementation Evaluation**

  -Audit – reconcile assets and trades
  -Detailed cost breakdown
  -Implementation shortfall analysis

The above outline glosses over many of the more operational steps. For more detailed outlines see Exhibits 3 through 5, which contain information showing the detailed steps during a transition and suggested calendars.

Choosing a Transition Manager

Certain types of transition management services have become commoditized. For a transition from one large-cap U.S. equity manager to another, most service providers will execute reasonably well. The differences lie with customer service, administrative support, and reporting capabilities. Beyond a plain vanilla transition, the choice of provider becomes important. More complex transitions might include multiple asset classes, substantial international equities, illiquid securities, large fixed income component, large total transition size, particular investor biases, etc. At this point, the best strategy is to start by choosing a category of provider and then a particular provider, based on specific transition characteristics. Below is a table that lays out which types of providers to choose given general transition characteristics. For a transition that does not neatly match the characteristics in the table, reviewing one broker-dealer, one index provider, and one custodian would provide a good sample of all three options. A detailed ranking of service providers can be found in Exhibit 1.

	Transition Characteristics
Choose Broker-Dealer if…	Large dollar-size of assets, > $50 million Harder to trade, less liquid portfolios Large fixed income component More complex asset allocation Considering principal bids Large tracking error risk
Choose Index Manager if…	Highly liquid securities Large need for administrative support or client service Less complex asset allocations Large sensitivity to explicit costs Complete distrust of broker-dealers Medium to large dollar-size of assets, > $10 million
Choose Custodian if…	Desire to improve custodial relationship Great need for perceived trust Small transitions, > $5 million

Since the list of transition managers includes all of the major broker-dealers, custodians, and index-fund providers, investors are bound to have existing relationships. These will often play a key role in the final decision. There are a few transition managers that could be rated best of class, but the margin by which they are superior to their next competitor may legitimately be dominated by relationship factors.

The following is a list of selection criteria, given in order of importance, for an unspecified generic transition. To choose a provider it is necessary to re-prioritize the list for the transition, possibly adding other criteria important to the investor. For example, an institution with limited staff time may find the administrative support more important than having access to crossing flows.

- Risk management

  -Residual trading, analytic capabilities, derivatives, and ETF experience
- Trading expertise

  -U.S. equity
  -International equity
  -Fixed income
- Transition management experience
- Access to crossing flows

  -Internal/External
- Client reporting capabilities

  -Pre-, intra-, and post-transition
- Client service capabilities
- Administrative support services
- Low explicit costs

Performance record is not included in this list because the unique nature of each transition makes it virtually impossible to compare performance across transitions. For example, even two very similar transitions will perform in very different ways if effected on different days. Because of this, there is no industry standard for measuring the success of transitions.

It is possible to ask providers by how much they beat their estimates on average, but these data are hard to interpret. A study by Frank Russell & Co. suggests that the average cost of a transition was 99 bps greater than estimates from transition providers, suggesting that providers have been giving estimates of cost that were too low. The research for this paper indicates that the best measure would be the percentage of time actual implementation shortfall fell within the predicted range. This information is currently not available because investors have not historically asked for estimates of tracking error.

Obtaining pre-trade analytics involves two basic steps: sending representative portfolios to the transition manager and evaluating the pre-trade reports provided. Both seemingly simple steps involve some degree of complexity. If the time of the transition is close at hand, it may be a bad idea to send the actual portfolios that will be traded and a representative portfolio or detailed portfolio characteristics could be sent instead. Sometimes, however, sending the holdings is unavoidable, due to the poor liquidity or concentrated nature of the portfolio. If the transition is not imminent, or the portfolios are extremely liquid and do not represent a large portion of the daily volume in any individual names, actual portfolios may be sent with confidence that no information is being released. In the end it is just a matter of using prudent judgment as to what information is sent to obtain a cost estimate.

Pre-transition reporting varies greatly in terms of quality, the information included, and the manner of presentation. When comparing crossing estimates, investors should adjust these for the various definitions of crossing. For example, external crossing has a different definition for an index provider and a broker-dealer and crossing cost estimates are often overly optimistic or misleading due to definitional reasons. There is also variation in the calculation of estimated savings: for example, some vendors include the savings from securities delivered in-kind and others do not. In general, savings from in-kind transfers should be pulled out of the analysis because an investor would still get the savings from delivering the securities in-kind regardless of the process or provider chosen. The easiest way to compare is to sort savings or costs from various providers into the five categories of asset transfers listed in the transition implementation section. (It should be noted, however, that only about one-third of the transition managers include a tracking-error estimate in their standard reporting package.) Understanding these issues should allow translation of cost estimates into a common language for comparison.

Evaluating a Transition

There are four components to evaluate the expected cost and risk upon completion of a transition:

- risk management;
- cost reduction;
- trade execution; and
- service level.

Risk management is the most important piece of a transition to evaluate. A good understanding of what went on in the marketplace during the transition will help the investor determine whether risk was well managed. The first thing to examine is how close the implementation shortfall was to the expected cost. For example, if we assume that the expected cost was 20 bps and the tracking-error risk was 40 bps and that there was nothing usual about the market movement or volume during the transition: if the implementation shortfall was -70 bps (implying a gain), this is greater than two standard deviations away from what was expected (100 bps to -60 bps) and although the outcome was beneficial, the magnitude of the gain implies faulty risk control and the potential for a comparable loss on any future transition effected by this manager.

Cost reduction should come close to original estimates. Commissions are often guaranteed but the amount of cross is usually not. As a result, if the cross estimates were too aggressive, costs will be higher than originally estimated. In addition, investors should watch for aggressive estimation of spreads and expected impact costs by examining the actual costs after the transition to see if they are greater than the estimates.

Trade execution is difficult to evaluate. The only metric available is the trading benchmark, which will most often be VWAP. If the trade occurs close to or under VWAP there can be some confidence the trading was done reasonably well, but execution is always difficult to evaluate.

Customer service will often make the difference in how an investor feels about the outcome of a transition. Good customer service and communication breeds trust for future interactions. This can be judged based on the level and speed of communication with the investor and the amount of administrative burden absorbed by the manager.

Before hiring a transition manager, investors should give some thought to how important these four criteria are to their own definition of a successful transition. Transitions are by nature ambiguous and the best that can be said about a well-executed transition is that the total cost appears reasonable and that the quality of the client service was excellent. Understanding this inherent ambiguity helps alleviate some of the frustration that comes from attempting to calibrate transition results too finely.

EXHIBITS

Exhibit 1a

MANAGER RANKINGS AND STATISTICAL OVERVIEW

January 1, 2001 - June 30, 2002

					Trading Capabilities						Overall
	Category	Reporting	Admin	Client Service	U.S. Equity	Int'l Equity	Fixed	Cross	Experience	Risk Mgmt	Average
Morgan Stanley[A]	LP - Broker Dealer	2	2	1	1	1	1	2	1	1	1.3
Deutsche Bank	LP - Broker Dealer	1	2	3	1	1	1	2	1	1	1.4
UBS Warburg[B]	LP - Broker Dealer	2	2	2	2	1	1	2	2	1	1.7
Merrill Lynch	LP - Broker Dealer	1	3	2	1	1	1	2	3	1	1.7
Goldman Sachs	LP - Broker Dealer	3	2	2	1	1	1	2	3	1	1.8
Citigroup Global Markets	LP - Broker Dealer	3	4	2	1	1	1	2	2	1	1.9
Lehman Brothers	LP - Broker Dealer	2	4	3	1	1	1	2	2	1	1.9
Dresdner Kleinwort Wasserstein	LP - Broker Dealer	3	2	2	3	1	2	3	2	2	2.2
Bank of New York	LP - Broker Dealer	3	1	2	2	2	2	3	2	3	2.2
Lynch Jones & Ryan - Instinet[C]	LP - Broker Dealer	2	4	1	2	3	1	4	1	3	2.3
JP Morgan Chase	LP - Broker Dealer	U	U	U	U	U	U	U	U	U	U
Barclays Global Investors[D]	LP - Index Manager	2	1	1	2	2	3	1	1	1	1.6
State Street Global Advisors	LP - Index Manager	1	1	1	2	2	3	2	1	1	1.6
State Street Global Advisors	LR - Custodian	1	1	1	2	2	3	2	1	1	1.6
Mellon	LR - Custodian	1	1	1	2	2	3	4	1	2	1.9
Bank of New York	LR - Custodian	3	1	2	2	2	2	3	2	4	2.3
Northern Trust	LR - Custodian	U	U	U	2	3	3	3	U	U	U
Frank Russell Securities	LR - Third Party	U	U	U	U	U	U	U	U	U	U
Donaldson & Co	LR - Third Party	U	U	U	U	U	U	U	U	U	U

Rating System

1 - Best	LR - Liquidity Reseller	A -Best overall broker/dealer
2 - Very Good	LP - Liquidity Provider	B -Best international transition option
3 - Good		C -Best overall fixed income option
4 - Poor		D -Best index provider option
U - Unrated		

Exhibit 1b

MANAGER RANKINGS AND STATISTICAL OVERVIEW

January 1, 2001 - June 30, 2002

	Services			Offices		Employees			Experience	Size
	Transition Mgmt/ Program Trading/ Both	Agency/ Principle/ Both	Fiduciary	Europe	Asia	Employees	Avg. tenure (range)	Client Service	Years (Transition Mgmt/Portfolio Trading)	Small Transition ($ millions)
Barclays Global Investors	Transition mgmt	Both	Yes	Yes	Yes	48	7 (1 - 20)	NR	7 / 17	$5
State Street Global Advisors	Both	Both	Yes	Yes	Yes	80	7 (0.5-10)	14	7 / 24	$5
Goldman Sachs	Both	Both	No	Yes	Yes	20	8	7	1 / 26	$50
Morgan Stanley	Both	Both	No	Yes	Yes	7	15	7	14	$20
Deutsche Bank	Both	Both	Yes	Yes	Yes	35	10 (1-20)	NR	NR / 11	$50
Merrill Lynch	Both	Both	Yes	Yes	Yes	32	8 (1-20)	15	1.5 / 5	$25
UBS Warburg	Both	Both	Yes	Yes	Yes	56	10 (1 - 30)	15	2 / 12	$25
Lehman Brothers*	Program Trading	Both	No	Yes	Yes	NA	11	12	NR	$25
Citigroup Global Markets	Both	Both	No	Yes	Yes	8	10 (6 - 20)	8	10 / 20	$50
Lynch Jones & Ryan - Instinet	Both	Agency	Yes	Yes	Yes	10	10	8	15 / 17	none
Mellon	Transition mgmt	Both	Yes	No	No	15	1 (1 - 2)	15	1 / 18	$20
JP Morgan Chase	Both	Both	No	Yes	Yes	13	12 (5-18)	8	1	$5
Dresdner Kleinwort Wasserstein	Both	Both	No	Yes	Yes	8	NR (2 - 5)	NR	NR	none
Northern Trust	Both	Both	Yes	Yes	Yes	7	NR	NR	1 / 15	$10
Bank of New York	Both	Both	Yes	No	No	8	4 (1-20)	2	12	$50

Source: Data collected from RFI and over 40 meetings/conversations for this paper. Data are self-reported unless noted otherwise.

Note: There are no data for Frank Russell and Donaldson & Co.
NR - Not Reported NA - Not Applicable
*Lehman Brothers does transitions through their program trading desk, they do not have people dedicated specifically to transition management.

Exhibit 1c

MANAGER RANKINGS AND STATISTICAL OVERVIEW

January 1, 2001 - June 30, 2002

	Transitions (one way) ($ millions)						Trading Capabilities ($ millions)				
	> $1 billion	> $150 million	< $150 million	Total	Total Market Value	$ Value of largest	Program Trading (one way)	Total Trading Volume[2]	Internal Crossing Volume	External Crossing Volume	2001 Market Share in FX[3]
Barclays Global Investors	46	231	560	837	$140,000	$18,250	$0	$1,140,375	$105,000	$23,850	NM
State Street Global Advisors	62	521	500	1021	$378,000	$15,500	$96,200	$974,200	$139,081	$137,971	3.0%
Goldman Sachs	NR	NR	NR	NR	$105,000	> $5,000	$500,000	$2,678,948	20-40%	10-30%	7.1%
Morgan Stanley	53	NR	NR	319	$75,000	$19,600	$487,500	$2,732,239	5-95%	30-35%	2.9%
Deutsche Bank	48	115	385+	500+	$250,000	$5,750	$1,000,000	$1,301,215	$270-465,000	$40-95,000	9.1%
Merrill Lynch	NR	NR	NR	NR	$60,000	$12,500	$225,000	$4,511,830	$77,500	NR	1.4%
UBS Warburg	NR	NR	NR	78	$25,115	NR	$337,500	$2,308,787	NR	NR	3.6%
Lehman Brothers	NA	NA	NA	NA	NA	NA	$241,000	$1,976,386	NR	NR	0.4%
Citigroup Global Markets[1]	26	123	259	408	$59,385	$3,000	$200,304	$3,657,179	15-53%	6-10%	9.7%
Lynch Jones & Ryan - Instinet	0	10	190+	200+	$12,000	$839	$50,000	$1,740,000	$0	$75,000	NM
Mellon	0	11	107	118	$7,100	$698	$0	$9,336	$194	$609	0.2%
JP Morgan Chase[2]	0	6	18	24	> $3,000	$850	$150,000	$1,500,000	10%	NR	5.2%
Dresdner Kleinwort Wasserstein	2	50	28	80	$30,000	$1,750	$150,000	NR	10-50%	10%	0.6%
Northern Trust	NR	NR	NR	176	$8,855	$1,500	NA	$75,000	$1,100	$9,900	0.7%
Bank of New York	3	152	175	327	$29,400	$1,300	$101,600	NR	$5,900	NR	0.6%
				TOTAL	**$1,174,000**						

Source: Data collected from RFI and over 40 meetings/conversations for this paper. Data are self-reported unless noted otherwise. Numbers received from providers arrived in many different formats and every effort has been made to make the numbers comparable while maintaining their integrity.

Notes: There are no data for Frank Russell and Donaldson & Co. Most numbers are estimates intended to give a sense of market size and relative position of a provider within the market. Shaded trading volume numbers are from Thompson AutEx and include listed business, Nasdaq, and ADRs. The shaded numbers do not include international equity or fixed income trading volumes. Numbers are not completely comparable because they include different types of trading, but should give a sense of magnitude and relative positions of the providers.
NR - Not Reported NA - Not Applicable NM - Not Meaningful

[1] Citigroup Global Markets reported program trading volumes only for U.S. NYSE volume.

[2] JP Morgan is estimated for 18 months based on all equities traded including international. State Street, Barclays, LJR, and Mellon data are numbers reported by the respective institutions for all trading: U.S., International, and Fixed Income.

[3] Market share data from *Euromoney*'s May 2001 FOREX Poll.

Exhibit 1d

MANAGER RANKINGS AND STATISTICAL OVERVIEW

Asset Allocation Breakdown for Completed Transitions

January 1, 2001 - June 30, 2002

	U.S. Equity (%)				Int'l Equity (%)		
	Large	Mid	Small	Total	Developed	Emerging	Total
Barclays Global Investors	NR	NR	NR	45	NR	NR	41
State Street Global Advisors	36	7	13	56	41	1	41
Goldman Sachs	20	10	10	40	18	3	20
Morgan Stanley	46	NR	9	55	NR	NR	44
Deutsche Bank	23	10	3	35	10	5	15
Merrill Lynch	35	NR	2	38	42	NR	42
UBS Warburg*	54	NR	14	68	NR	NR	32
Lehman Brothers*	58	16	7	80	NR	NR	20
Citigroup Global Markets	NR	NR	NR	43	NR	NR	24
Lynch Jones & Ryan - Instinet	NR	NR	NR	73	NR	NR	7
Mellon	18	3	24	44	33	6	39
JP Morgan Chase	NR	NR	NR	40	NR	NR	20
Dresdner Kleinwort Wasserstein	NR	NR	NR	56	NR	NR	24
Northern Trust	53	NR	15	68	NR	NR	16
Bank of New York	NR	NR	NR	29	NR	NR	43

	Fixed Income (%)						
	U.S. Corp/Govt	Mortgages	Municipal	High Yield	Int'l Dev Mkt	Emerging	Total
Barclays Global Investors	NR	NR	NR	NR	NR	NR	14
State Street Global Advisors	1	1	0	0	0	0	2
Goldman Sachs	15	10	3	3	8	3	40
Morgan Stanley	NR	NR	NR	NR	NR	NR	1
Deutsche Bank	20	8	8	3	10	3	50
Merrill Lynch	9	NR	NR	NR	12	NR	20
UBS Warburg*	NR	NR	NR	NR	NR	NR	NR
Lehman Brothers*	NR	NR	NR	NR	NR	NR	NR
Citigroup Global Markets	NR	NR	NR	NR	NR	NR	34
Lynch Jones & Ryan - Instinet	NR	NR	NR	NR	NR	NR	20
Mellon	8	8	0	1	3	0	20
JP Morgan Chase	30	NR	NR	NR	10	NR	40
Dresdner Kleinwort Wasserstein	NR	NR	NR	NR	NR	NR	20
Northern Trust	NR	NR	NR	NR	NR	NR	16
Bank of New York	NR	NR	NR	NR	NR	NR	28

Source: Data collected from RFI and over 40 meetings/conversations for this paper. Data are self-reported unless noted otherwise.

Note: There are no data for Frank Russell and Donaldson & Co.
NR - Not Reported

* UBS Warburg and Lehman Brothers did not provide information on fixed income transitions.

Exhibit 2

ESTIMATES OF EXPLICIT COSTS AND TRACKING ERROR FOR AN UNMANAGED TRANSITION

(in basis points)

	Commission	Spread	Market Impact	Total Cost	Liquidation Time
U.S. Large-Cap	20	11	9	**40**	30 mins to 1 day
U.S. Mid-Cap	20	18	17	**55**	2.5 hrs to 3 days
U.S. Small-Cap	20	30	35	**85**	1 to 3 days
Global ex U.S. Equity Large	20	20	15	**55**	30 mins to 3 days
Global ex U.S. Equity Mid/Small	20	45	45	**110**	1 to 3 days
Emerging Mkts Equity	25	65	110	**200**	2 to 6 days
U.S. Corp/Govt Bonds		13		**13**	1 day
Municipal Bonds		10		**10**	1 to 2 days
High-Yield Bonds		120		**120**	1 to 3 days
Global ex U.S. Bonds		15		**15**	1 to 2 days
Emerging Mkts Bonds		100		**100**	1 to 5 days

One-way costs based on $50 million portfolio.
Commissions based on 6 cents a share

Usage Example
Transition from a large-cap value to large-cap growth portfolio

Commissions	20 bps x 2	=	40 bps
Spread	11 bps x 2	=	22 bps
Market Impact	9 bps x 2	=	18 bps
Total Expected Cost			**80 bps**

Tracking Error (from the table on the adjacent page) **80 bps**

95% confidence interval 80 +/- 2 x 80 bps **(240, -80)**

Notes: All transition managers were asked to give their best estimates for trading costs on a $50 million liquidation of index-like exposures for the asset classes in the table. The numbers are an average of the estimate provided.

Exhibit 2 (continued)

ESTIMATES OF EXPLICIT COSTS AND TRACKING ERROR

Daily Tracking Error	Switching To or From (%)																
	U.S. Large-Cap	Growth	Value	U.S. Mid-/Small-Cap	Growth	Value	Global ex U.S. Equity	Growth	Value	Emerging Mkts Equity	U.S. Corp/Govt Bonds	Municipal Bonds	High-Yield Bonds	Global ex U.S. Bonds	Emerging Mkts Bonds	Public Real Estate	Cash
Switching To or From																	
U.S. Large-Cap																	
Growth	0.41%																
Value	0.39%	0.80%															
U.S. Mid-/Small-Cap	0.57%	0.83%	0.53%														
Growth	0.56%	0.72%	0.66%	0.47%													
Value	0.73%	1.00%	0.63%	0.28%	0.74%												
Global ex U.S. Equity	1.34%	1.59%	1.18%	1.18%	1.48%	1.07%											
Growth	1.33%	1.59%	1.17%	1.17%	1.46%	1.05%	0.14%										
Value	1.36%	1.61%	1.20%	1.21%	1.50%	1.11%	0.13%	0.27%									
Emerging Mkts Equity	1.34%	1.59%	1.20%	1.25%	1.50%	1.16%	0.87%	0.88%	0.88%								
U.S. Corp/Govt Bonds	1.42%	1.60%	1.35%	1.21%	1.59%	1.03%	0.96%	0.94%	1.00%	1.04%							
Municipal Bonds	1.17%	1.34%	1.14%	1.36%	2.06%	1.01%	1.07%	1.16%	1.08%	1.86%	0.15%						
High-Yield Bonds	1.42%	1.65%	1.28%	1.24%	1.59%	1.08%	0.98%	0.99%	1.00%	0.83%	0.68%	0.50%					
Global ex U.S. Bonds	1.56%	1.69%	1.54%	1.38%	1.72%	1.21%	1.09%	1.06%	1.14%	1.25%	0.51%	0.53%	1.01%				
Emerging Mkts Bonds	1.28%	1.48%	1.20%	1.15%	1.45%	1.03%	0.96%	0.91%	1.02%	0.92%	0.77%	1.21%	0.85%	1.04%			
Public Real Estate	1.30%	1.50%	1.22%	1.01%	1.41%	0.81%	1.10%	1.08%	1.13%	1.17%	0.79%	0.84%	0.94%	0.99%	0.99%		
Cash	1.13%	1.31%	1.10%	1.33%	2.02%	0.99%	1.03%	1.12%	1.03%	1.82%	0.24%	0.23%	0.47%	0.55%	1.19%	0.82%	
Average	1.08%	1.32%	1.06%	1.01%	1.33%	0.96%	0.91%	0.94%	1.01%	1.11%	0.83%	0.80%	0.99%	1.08%	0.99%	1.01%	0.86%
Min	0.13%																
Max	2.06%																

Notes: All tracking errors calculated with daily index returns from April 2002 to June 2002 except T-Bills and Municipal Bonds. T-Bill and Municipal Bond data were available on a monthly basis. Daily tracking errors estimated from five years of monthly return data--July 1997 through June 2002.

U.S. Large-Cap	S&P 500	**Global ex U.S. Equity**	MSCI EAFE	**High-Yield Bonds**	CGM HY Market Index
Growth	S&P 500 Growth	**Growth**	MSCI EAFE Growth	**Global ex U.S. Bonds**	JPM Global ex U.S.
Value	S&P 500 Value	**Value**	MSCI EAFE Value	**Emerging Mkts Bonds**	JPM EMBI+
U.S. Mid-/Small-Cap	Russell 2500™	**Emerging Mkts Equity**	MSCI EM Free	**Public Real Estate**	MS REIT
Growth	Russell 2500™ Growth	**U.S. Corp/Govt Bonds**	CGM Broad Inv Grade	**Cash**	91-Day T-bill
Value	Russell 2500™ Value	**Municipal Bonds**	Lehman Bros Muni Index		

Exhibit 3

MORGAN STANLEY TRANSITION CHECKLIST

Action Item	Responsible Parties				
	CLIENT	Morgan Stanley	Custodians	New Managers	Morgan Stanley Broker
Planning and Administration					
Issues related to manager terminations					
1. Separate A/C vs. Commingled A/C	X	X		X	
2. If commingled, determine cash only or in-kind receipt of security	X				
3. Timing of receipt of funds or securities based on fund opening times	X	X			
4. Crossing opportunities with legacy managers	X	X			
Transition related documentation					
1. Letter of Agreement with Transition Agent	X	X			
2. Futures documentation, if applicable		X			
3. ISDA related swap documentation, if applicable		X			
Custodian Issues					
1. Transition A/Cs where applicable		X	x		
2. Exchange account settlement instructions		X	x		
3. Test file transfer systems		X	x		
4. Monitor corporate actions in Legacy portfolio		X	x		
5. Establish Standard Data format for information flow		X	x		
Morgan Stanley and client discuss equitization and cash flow issues					
1. Need for equitization (futures, ETFs)	X	X			
2. Foreign Exchange: timing and execution	X	X	x		
Contact lists created					
1. Morgan Stanley Transition Team	X	X	x		
2. Custodian contacts	X	X	x		
3. CLIENT contact list	X	X	x		
Execution Process					
1. Conference calls with involved parties to discuss timing, roles and responsibilities, etc.	X	X	x		
2. Morgan Stanley and Custodian discuss confirm process, settlements instructions, foreign exchange executions	X	X	x		
3. Morgan Stanley creates calendar of transition showing timing and roles and responsibilities	X	X			

Exhibit 3 (continued)

MORGAN STANLEY TRANSITION CHECKLIST

Morgan Stanley Action Item	Responsible Parties CLIENT	Morgan Stanley	Custodians	New Managers	Morgan Stanley Broker
Transition Related Actions					
1. Terminate and freeze managers	X				
2. Do terminated managers have futures contracts open	X		X		
3. Custodian reconciles holdings with terminated managers in order to create certified asset lists			x		
4. Ensure securities on loan are returned prior to certification	X		x		
Pre-Trade					
1. New manager wish lists delivered to CLIENT via Excel™ spreadsheets	X			x	
2. Certified holdings lists delivered to Morgan Stanley & CLIENT	X	X	x		
3. Reconciliation process begins. Kickouts identified in both legacy & target portfolios. CLIENT notified	X	X	x		
4. Morgan Stanley QS Pre-Trade Analysis performed on holdings and wish lists	X	X			
5. Transition strategy alternatives discussed	X	X			
Implementation					
1. Daily Trade List created by QS	x	X			
2. Trading - Daily trade lists sent to executing brokers	x	X			x
3. Brokers send execution fill files to CLIENT, custodian & QS	x				x
4. Daily updates on progress: more frequent if necessary	x	X			
5. Settlements					
6. Update currency and cash requirements	x	X			
Post Transition					
1. MS will double check account fill information	x	X			
2. Custodian settles trades, reconciles and transfers portfolios to new managers			x		
3. Cash used to top off managers where necessary	x	X	X		
4. Morgan Stanley runs Post-Trade analysis and delivers to Client (timing dependent on complexity)	x	X			
Transition Daily Status Report					
1. Daily reconciliation of executions and open position		X			
2. Run daily post-trade and provide summary status to CLIENT	x	X			
3. Begin next day trading strategy	x	X			
4. Compare failed trades daily			x		x

Source: Morgan Stanley.

Exhibit 4

BANK OF NEW YORK GLOBAL TRANSITION MANAGEMENT: TRANSITION TIMELINE

		RESPONSIBLE PARTIES			
	ACTIVITY	**CLIENT**	**CUSTODIAN**	**BNY GTM**	**TARGET MANAGERS**
STAGE 1					
Developing a Blueprint *(Planning & Coordination)* 1-5 days	• Transition Management Agreement	X		X	
	• Sample notification letters supplied to client			X	
	• Dates of cease trading and termination are determined (contractual termination clauses are noted; GTM recommends cease trade 3-5 days prior to termination)	X			
	• New manager contracts are in place	X			
	• Commingled or separately managed accounts are determined	X			
	• Commingled funding dates are determined (if applicable)	X		X	
	• Commingled funds receiving cash and/or securities are determined	X		X	
	• Type of equitization is established, if necessary	X		X	
	• Timing and cash flow issues are discussed (benefit payments are addressed here, if applicable)	X		X	
	• Benchmarks are selected	X		X	
	• Contacts for legacy and target managers and custody are provided to GTM	X			
	• Transition participants (custodian, legacy, and target managers) receives written notification of restructuring, as well as GTM's role as transition manager	X			
	• GTM appoints Transition Client Coordinator				
	• Transition Client Coordinator begins coordination with target and legacy managers, as well as custodian - (timing, process, and requirements are explained)			X	
	• Custodian opens new accounts and/or transition account, if applicable		X		
	• GTM appoints Transition Supervisor to manage custody contacts			X	
	• Target amounts are established for the target portfolio(s)	X			
	• Transition Client Coordinator composes transition strategy			X	
STAGE 2					
Pre-Trade 3-5 days	• Transition Supervisor contacts custody to coordinate settlement process and designates responsibilities	X		X	
	• Custodian supplies GTM with appropriate contacts for cash movements and trade settlement		X		
	• Transition Supervisor sends written request for certified asset list in legacy portfolio and enumerates custodian and GTM's responsibilities			X	
	• Custodian reconciles assets in legacy portfolio accounts (recalls stock loan items, audits, notes corporate actions)		X		
	• Custodian confirms assets are in good order and supplies		X		
	• GTM with a certified asset list of the legacy portfolio				
	• Transition Client Coordinator requests asset lists from the target managers based on targets designated by client			X	X
	• Transition Supervisor compares buy and sell portfolios and removes securities that can be transferred in-kind (equities)			X	
	• Transition Supervisor offers legacy lists to new managers to select securities to transfer in-kind (fixed income only)			X	X
	• Transition Trading Strategists are assigned to the transition			X	
	• Transition Trading Strategists conduct pre-trade analytics on the buy and sell portfolios			X	

Exhibit 4 (continued)

BANK OF NEW YORK GLOBAL TRANSITION MANAGEMENT: TRANSITION TIMELINE

		RESPONSIBLE PARTIES			
	ACTIVITY	**CLIENT**	**CUSTODIAN**	**BNY GTM**	**TARGET MANAGERS**
STAGE 3					
Trading	• Transition Trading Strategist determine a cost-effective trading approach (agency crossing, block desk, ECNs, trading technology, etc.)			X	
1-5 days	• Transitions Trading Strategist disperses the trades to the appropriate traders			X	
STAGE 4					
Post-Trade	• Transition Supervisors affirms all trades (on T+1)			X	
Settlements	• Transition Supervisor requests the custodian to move transfer in-kinds from the legacy accounts to the target accounts		X	X	
1-5 days	• Transition Supervisor and custodian confirm all trade settlement			X	
	• Transition Supervisor and custodian coordinate all cash movement		X	X	
	• Transition Supervisor and custodian coordinate funding of commingled funds by designated funding dates (if applicable)		X	X	
	• Transition Supervisor provides target managers with portfolio and starting cash balance (on S+1)			X	
	• Custodian and new managers reconcile assets		X		X
STAGE 5					
Post-Trade	• Transition Client Coordinator provides client with a post-trade analysis report (summarizing costs and savings)			X	
(14 days approx)					

Source: Bank of New York.

Exhibit 5

UBS WARBURG: TRANSITION RESPONSIBILITIES AND TIMELINE

Decision is made to change managers, asset allocation, or benchmarks. Money Manager and Transition Manager search begins.	Plan Sponsor and Consultant	Day 0
Transition Manager Selection	Plan Sponsor	Day 0
New Managers are chosen	Plan Sponsor	Day 0
Create a Transition Plan - Define Overall Expectations - Determine Timeframe for Transition - Portfolio Valuation - Hedging Strategy - Risk Tolerance - Benchmark	Plan Sponsor, Consultant, and UBS Warburg	Day 1
Approval of Transition Agreement	Plan Sponsor and UBS Warburg	Day 1
Notification Letters are sent from the Plan Sponsor to Money Manager/s	Plan Sponsor	Day 1
Conference call between Plan Sponsor, Custodian, and Managers to discuss responsibilities and timeline in order to maximize efficiency of transition process.	UBS Warburg	Day 5
Transition Account is opened.	Custodian and UBS Warburg	Day 5
Certified list is distributed.	Custodian	Day 10
New Manager/s provide weightings to UBS Warburg	New Managers and UBS Warburg	Day 10
Trade List Check	UBS Warburg	Day 10
In-Kind Transfers are established	UBS Warburg and New Managers	Day 10
UBS Warburg performs pre-trade analysis on residual trades to determine estimated market impact and trading strategy. Results of the pre-trade analysis are discussed with appropriate parties.	UBS Warburg	Day 11, 12
Trading commences - Intra-day updates are provided - Execution reports are created - Confirmations are generated	UBS Warburg	Days 13, 14 (based on pre-trade analysis)
Settlement	UBS Warburg and Custodian	Days 16, 17
Asset / Cash Reconciliation	Custodian and UBS Warburg	Days 17, 18
Assets Transferred	Custodian	Day 19
Post-Trade Analysis - Execution vs Benchmark - Cost/Savings Analysis - Portfolio Valuation	UBS Warburg	Day 21

Exhibit 6

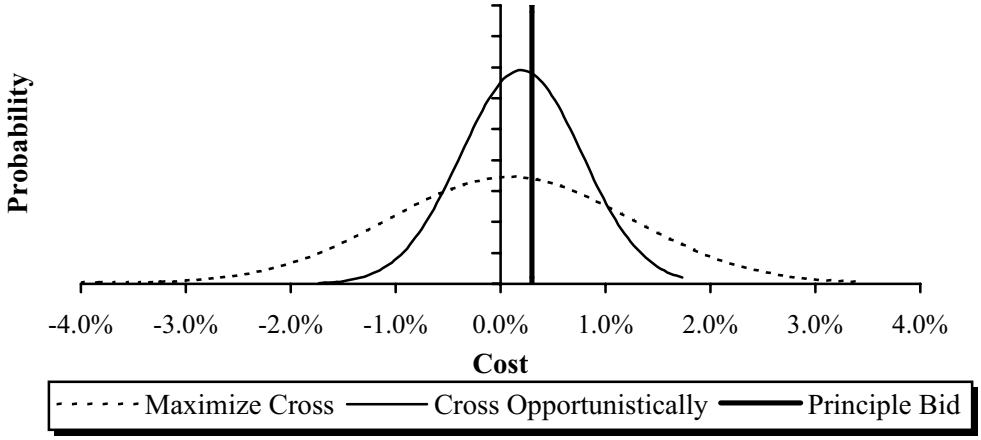
SAMPLE PRE-TRANSITION PRESENTATION

Pre-Transition Analysis Summary
Sale of $30 million of DEF Growth Fund
Purchase of $30 million of XYZ Value Fund

Summary of Cost and Risk of Transition

	Expected Shortfall	Tracking Error*	# days	Best Option
Maximize Cross	10 bps	+/- 200 bps	2	Provider A
Cross Opportunistically	20 bps	+/- 100 bps	1	Provider B
Principle Bid	30 bps	guaranteed	0	Provider B

Transition Options Cost Distribution



Outcome Ranges

	66% chance between*	
	83% chance >	83% chance <
Maximize Cross	$ 630,000.00	$ (570,000.00)
Cross Opportunistically	$ 360,000.00	$ (240,000.00)
Principle Bid	$ 90,000.00	$ 90,000.00

Breakdown of Expected Implementation Shortfall

	Explicit Costs	Market Impact	Total Expected Shortfall
Maximize Cross	6 bps	4 bps	**10 bps**
Cross Opportunistically	10 bps	10 bps	**20 bps**
Principle Bid	30 bps	0 bps	**30 bps**

* Tracking error is one standard deviation and the range is the mean +/- one standard deviation.

Exhibit 6 (continued)

SAMPLE PRE-TRANSITION PRESENTATION

Pre-Transition Analysis Detail

Portfolio Size	**$ 30,000,000.00**

Strategy 1: Maximize Cross

	Expected Costs Commissions	Taxes	Expected Market Impact	Total Expected Cost	Tracking Error*	Total Cost Range* (66% Chance Within)
Provider A	6 bps $ 18,000.00	0	4 $ 12,000.00	10 bps $ 30,000.00	+/- 200 bps $ 600,000.00	$ 630,000.00 $ (570,000.00)
Provider B	4 bps $ 12,000.00	0	7 $ 21,000.00	11 bps $ 33,000.00	+/- 210 bps $ 630,000.00	$ 663,000.00 $ (597,000.00)
Provider C	7 bps $ 21,000.00	0	5 $ 15,000.00	12 bps $ 36,000.00	+/- 205 bps $ 615,000.00	$ 651,000.00 $ (579,000.00)

Strategy 2: Cross Opportunistically

	Expected Costs Commissions	Taxes	Expected Market Impact	Total Expected Cost	Tracking Error*	Total Cost Range* (66% Chance Within)
Provider A	12 bps $ 36,000.00	0	8 $ 24,000.00	20 bps $ 60,000.00	+/- 115 bps $ 345,000.00	$ 405,000.00 $ (285,000.00)
Provider B	10 bps $ 30,000.00	0	10 $ 30,000.00	20 bps $ 60,000.00	+/- 100 bps $ 300,000.00	$ 360,000.00 $ (240,000.00)
Provider C	14 bps $ 42,000.00	0	12 $ 36,000.00	26 bps $ 78,000.00	+/- 145 bps $ 435,000.00	$ 513,000.00 $ (357,000.00)

Strategy 3: Principle Bid

	Expected Costs Commissions	Taxes	Expected Market Impact	Total Expected Cost	Tracking Error*	Total Cost Range* (66% Chance Within)
Provider A	35 bps $ 105,000.00	0	0 $ -	35 bps $ 105,000.00	+/- 0 bps $ -	$ 105,000.00 $ 105,000.00
Provider B	30 bps $ 90,000.00	0	0 $ -	30 bps $ 90,000.00	+/- 0 bps $ -	$ 90,000.00 $ 90,000.00
Provider C	38 bps $ 114,000.00	0	0 $ -	38 bps $ 114,000.00	+/- 0 bps $ -	$ 114,000.00 $ 114,000.00

* Tracking error is one standard deviation and the range is the mean +/- one standard deviation.

Exhibit 7

EXCHANGE-TRADED FUNDS: TRANSITIONAL STRUCTURE

$380 MM

Product Name	Min Acct Size/Fee	Term (mos)	Expense Ratio	Commission[1] (cents/share)	Share Price ($)	Bid-Ask Spread (bps)	Estimated Fee[2] $	Estimated Fee[2] bps
Exchange-Traded Funds								
Russell 3000® iShares	N/A	6	0.20%	3	62.40	10	1,125,385	30
DJ U.S. Total Market iShares	N/A	6	0.20%	3	52.11	36	2,203,067	58
Russell 1000® iShares	N/A	6	0.15%	3	59.36	13	1,181,226	31
S&P 500 iShares	N/A	6	0.09%	3	112.05	4	544,048	14
S&P 500 SPDR	N/A	6	0.12%	3	112.07	4	600,981	16
Russell 2000® iShares	N/A	6	0.20%	3	99.97	40	2,128,525	56
Russell 2000® Value iShares	N/A	6	0.25%	3	145.25	39	2,123,193	56
Russell 2000® Growth iShares	N/A	6	0.25%	3	55.31	71	3,566,665	94
MSCI EAFE iShares	N/A	6	0.35%	3	118.58	30	1,786,606	47

Estimating the Cost of an Exchange-Traded Fund

Example: $380 mm invested in Russell 3000® iShares for 6 months.

Management Fees		**Transaction Costs**				
Expense Ratio (0.20%) X Time Period (0.5 years) X Amount Invested ($380 MM)	+	Bid-Ask Spread (10 bps) X Amount Invested ($380 MM)	+	2 X Commission (3 cts/share) X # of shares (~ 6,089,744)	=	**Total Estimated Cost**
$380,000	+	$380,000	+	$365,385	=	**$1,125,385**

Sources: Bloomberg, Barclays Global Investors, and State Street Global Associates.

[1]Commisions are determined by the brokerage firm executing the trade. Commissions for iShares and SPDR provided by Barclays Global Investors and State Street Global, respectively.

[2]Fees for exchange-traded funds represent the sum of the expense ratio, adjusted for the time period, two times the commission, and the bid-ask spread.

Exhibit 7 (continued)

INDEX FUNDS: TRANSITIONAL STRUCTURE

$380 MM

Product Name	Min Acct Size/ Fee	Term (mos)	Mgt Fee for L-C Equity	Commission (cents/share)	Share Price	Transaction Cost/Mkt Impact (bps)	Estimated Fee* $	bps
Index Funds						**Assumes 0% crossing:**		
Barclays Global Investors	$5 mm Fee: $5,000	6	*Account size:* *$0-50 mm* 0.08% on all assets *$50mm-100 mm* 0.04% on all assets *Negotiable over $100 mm*	N/A	N/A	5 - 10	$266,000- $456,000	7 - 12
Northern Trust Global	$1 mm Fee: 10,000	6	0.05% on first $100m 0.03% over $100mm	N/A	N/A	5 - 10	$257,000- $447,000	9 - 14
State Street Global Advisors	$10 mm Fee: 10,000	6	0.08% on first $50 mr 0.06% on next $50 mm 0.04% on next $100 mm Negotiable over $250 mm	N/A	N/A	5 - 10	$281,000- $471,000	7 - 12
The Vanguard Group	$10 mm Fee: $5,000	6	0.05% of all assets	N/A	N/A	5 - 10	$285,000 $475,000	8 - 13

*Fees for commingled mutual funds represent annual rates, adjusted for the time period, times the investment pool market value plus the bid-ask spread.

Exhibit 8

LARGE-SCALE TRANSITIONS

When faced with a large-scale transition, the time horizon can grow from three months to 18 months. This is usually encountered when an institution performs an asset allocation review and changes its target allocation.

Large-scale transitions can be broken down into three broad steps:

1. Create and prioritize a sequence of actions that will take the portfolio from its current position to the target allocation.

2. Implement the strategy.

3. Review the strategy after each action, evaluating the existence of any material changes that would cause a revision of priorities and sequencing. Upon final completion, review the success of the overall transition.

There are four criteria that can be useful in determining the sequence of transition steps.

- Potential for diversification
- Relative valuation
- Active management alpha potential
- Liquidity – time required to enter/exit

The importance each of these criteria is will depend on the current portfolio. For example, if the portfolio is highly diversified, but underweight a heavily undervalued asset class, it might be most effective to search for new managers in that asset class first. The four criteria combine with priorities that are common to all investors and ones specific to each institution. These include things like hedging against deflation, reducing political risk, generating cash flow, etcetera.

Exhibit 9

SAMPLE RFP

This is an actual RFP used with a European client slightly modified for client anonymity. Answers for questions about trading capabilities and trading volumes are often hard to interpret and compare. Questions should be as specific as possible for the information needed for a particular transition. For example: if the transition is a bond liquidation, questions should be about bond trading capabilities and possibly even the specific type of bonds in the transition (government, corporate, high-yield, etc.).

TRANSITION MANAGEMENT QUESTIONNAIRE

(Please see attached schedule of assets for transition)

Organization

1. Please provide a detailed organization chart of your transition brokerage services operations.

2. Broadly describe the transition brokerage services you provide.

3. Briefly describe your firm's background and experience in providing transition brokerage services. Indicate how many years your company has been active in the transition brokerage services, including a brief overview of your trading capabilities.

Experience and Staff

1. List the transitions you have performed over the past 12 months that were in excess of $1 billion (buys and sells). Break out U.S. and non-U.S. equity, and U.S. and non-U.S. fixed income.

2. Please provide a description of how you would handle transition-related FX transactions and describe your FX trading abilities.

3. Describe your transition management client base. Does it include any XYZ organizations or other NGOs?

4. Do you have dedicated transition management staff? If yes, how many dedicated professionals are there on your transition management staff?

5. Detail the experience of the transition team currently in place.

6. Where is the transition management team based?

7. Describe how you would service a client based in City, Country.

Exhibit 9 (continued)

SAMPLE RFP

Trading Capabilities

1. Detail your firm's trading capabilities, highlighting U.S. and non-U.S. equity and fixed income, and FX trading capabilities as relates to transition management.

2. Provide the dollar value of your firm's trading volume in calendar year 2001.

3. Detail your access to various sources of liquidity.

4. Describe your firm's capabilities in derivatives, exchange-traded funds, and other equitization vehicles.

5. Describe your firm's technology and analytic capabilities as it relates to transition management.

Transition Trading Strategy

1. Suggest a transition plan you believe will be most effective in this case. Include in the summary analysis estimations on the internal cross, external cross, liquidity, sector analysis, tracking risk, estimated market impact (both including and excluding internal cross), and momentum analysis. Explain how you would minimize risk.

2. Discuss in more detail the timing of transition, use of derivatives, agency vs. principal trading, crossing (internal and external), maintenance of market exposure, confidentiality, and any other topics you believe are relevant.

3. Please detail how, within the transition plan suggested, you would maximize crossing opportunities.

4. What is your risk management process during the trading period?

Back-Office Structure and Reconciliation

1. Discuss how you plan to handle issues arising from reconciliation with the custodian during the transition (in particular dividends, corporate actions, and taxation).

2. Specify who would be responsible for management of the reconciliation of the transition and to whom, within the organization, they would report.

Exhibit 9 (continued)

SAMPLE RFP

Performance Measurement

1. Specify the approach you would use for measuring the performance of the transition and its appropriateness for this particular transition.

2. Can you provide an estimate of the expected shortfall between the performance of the transition portfolio and the target portfolio over the period of the transition? Within what range would you expect your performance to fall? Do you think this is an appropriate way to measure your performance for this transition?

Fees/Costs

1. Provide an estimate of the fee you would charge for conducting this transition. Do you charge a fee on top of commissions?

2. Provide estimates of the total expected cost of conducting these transactions (commissions, fees, plus market impact and opportunity cost). State the assumptions used in arriving at these estimates.

3. Suggest any performance-based fees you would be willing to consider for the transition.

Legal

1. Have your transition brokerage services been the subject of litigation or claims in the last five years? If so, for each instance, discuss the nature of the suit or claim, including its resolution and current status.

2. Describe any additional potentially adverse issues or concerns regarding your firm or its personnel that we should be aware of in considering your firm as transition broker.

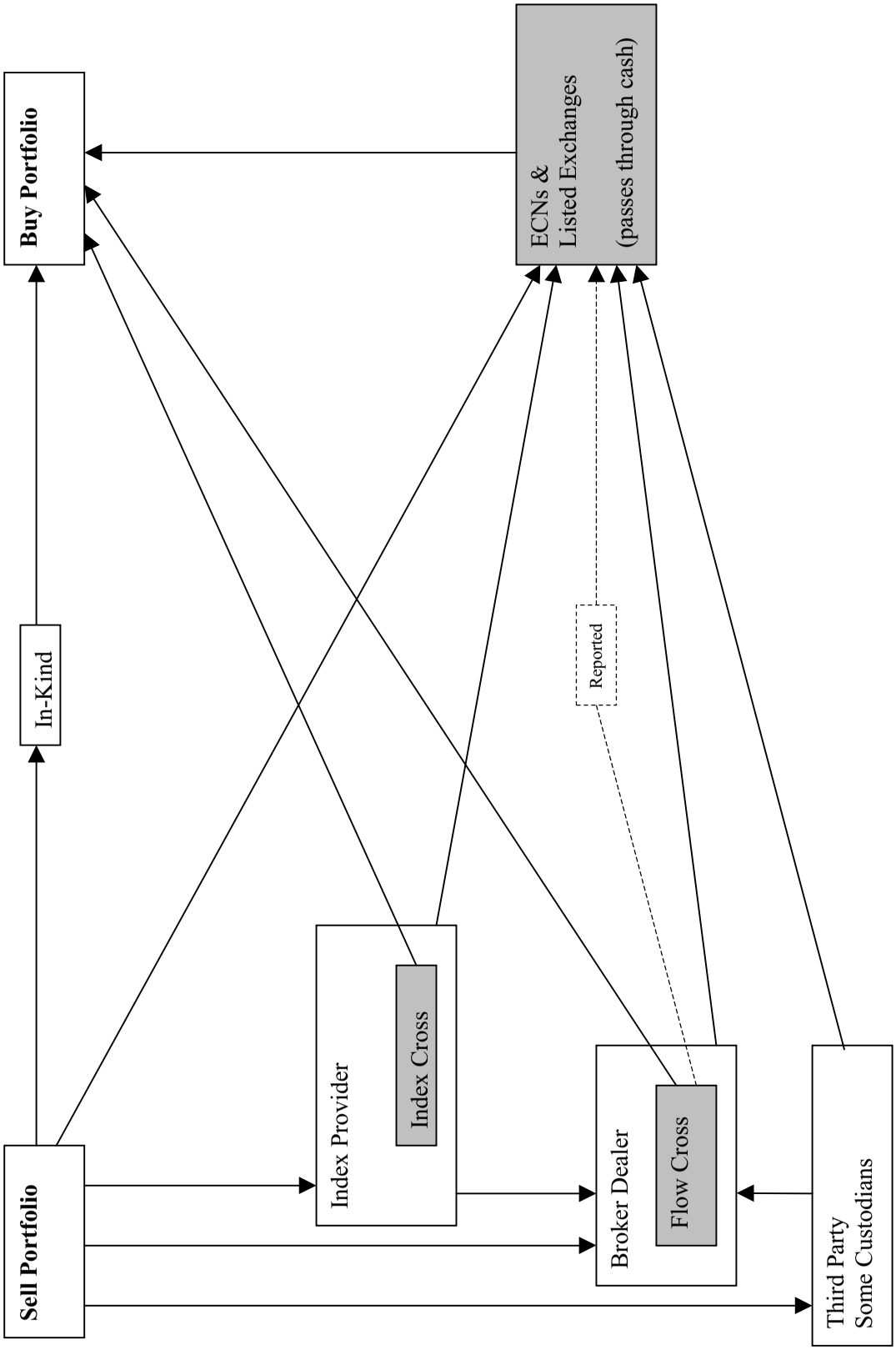
3. Are you willing to be a fiduciary with regards to your transition management role?

Other

Supply any other information that you consider relevant.

Exhibit 10

TRANSITION FLOW MAP



Note: Shaded boxes represent a liquidity source.

APPENDICES

Appendix A

TABLE OF SYNONYMS AND SELECTED DEFINITIONS

Term	Equivalent Terms
Market Impact	Impact Performance
Tracking Error	Opportunity Cost Risk Standard Deviation Timing + Trend Gap + Direction + Drift
Implementation Shortfall	Shortfall Transition Performance Total Cost
In-kind	Matching Crossing
Bid-ask	Bid-offer
Principal Bid	Risk Trading Risk Bid Principal Trade On a Principal Basis

Portfolio Trading (same as program trading) - Every major broker-dealer has a large portfolio trading desk. They are called portfolio trading desks because the trades are done for an entire portfolio of stocks instead of trading each stock individually. Historically, the clients of portfolio trading desks were large mutual funds who might consolidate a portion of their trading into a portfolio. Portfolio traders break apart portfolios and redirect the trades to the best source of liquidity they can find for each position. Transition management at the broker-dealers has been built on top of these capabilities and transition managers without trading operations use them extensively. Portfolio trading can be thought of as the engine of transition management. Transition management is a complete package that includes planning, administrative functions, and client service above the level that program trading desks are set up to offer.

Block Trading - Refers to trading desks in broker-dealers that buy and sell large positions in individual stocks, not portfolios. Portfolio trading desks access the block trading desk as one resource to use in trading a portfolio of stocks.

Principal Bid - In a principal bid, a broker-dealer will offer a guaranteed price and cost at which to trade a portfolio. There are a variety of ways this is done, one being a blind bid where a manager only sends portfolio characteristics to the broker-dealer who in turn gives a cost and price bid for the portfolio. Example: for the Russell Index rebalancing, the broker-dealers were bidding out rebalancing trades at a guaranteed price of 4 bps above VWAP.

VWAP (Volume Weighted Average Price) - VWAP is calculated by adding up each trade price during the day multiplied by the percent of the daily volume the trade represents.

Wish List - A list of securities provided by the new manager that they will accept in lieu of cash for funding the investor's account.

Appendix B

TRANSITION MANAGEMENT FIRMS: CONTACT INFORMATION

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