

## DC Plans Under Performed DB Funds

Defined Contribution plans under performed Defined Benefit funds by a wide margin over a long period—by 1.8% per year over the eight-year period ending in December 2005. On an annual basis, DC plans have under performed DB funds for seven consecutive years, through up and down markets, to 2005. The findings were based on the CEM investment performance databases which comprised 616 DC plans with total assets of \$500 billion and 1,323 DB funds with total assets of \$2 trillion. The performance difference between DC plans and DB funds is shown in Table 1.

Table 1: Defined Benefit versus Defined Contribution Performance, 1998- 2005			
	Defined Benefit (8-yr avg)	Defined Contribution (8-yr avg)	Difference (DB-DC)
Total return	7.5%	5.7%	1.8%
-Policy return or weighted benchmark return <sup>1</sup>	6.7%	5.1%	1.6%
=Gross value added	0.8%	0.6%	0.2%
-Costs	0.4%	0.4%	0.0%
=Net value added	0.4%	0.2%	0.2%

<sup>1</sup>Policy return was used for DB funds while benchmark returns weighted by asset classes were used for DC plans.

What is the effect of this 1.8% difference on the DC participant's future account value? At the end of 25 years, the effect is a reduction in that participant's future account value by 34%.

The key driver for the under performance of DC plans was differences in asset mix. The return of DC participants was reduced by large holdings of under performing GICs, company stock and cash. This group of assets accounted for 41% of DC plan assets but only 1% of DB fund assets. These assets crowded out better performing asset classes such as foreign stock, real estate and alternative investments. These better performing asset categories made up only 4% of DC plan assets compared with 24% of DB fund assets. The asset mix differences are shown in Table 2.

The largest negative impact on DC plan returns was produced by company stock. From 1998 to 2005, the average compound return on company stock was 1.7% compared with 4.8% for the S&P 500 or 6.0% for the Lehman Aggregate Bond Index. Further, the increase in risk through holdings of company stock was noteworthy. Over the eight-year period, the standard deviation in returns for company stock was 38%. This volatility was twice that of the S&P 500.

**Table 2: Asset Mix Differences Between Defined Benefit Funds and Defined Contribution Plans, 1998-2005**

Asset Class	Defined Benefit (8-yr avg)	Defined Contribution (8-yr avg)
<b>Stocks</b>		
Company stock	0%	19%
Large cap	40%	38%
Small Cap	5%	6%
Foreign	16%	4%
Total stocks	61%	67%
<b>Bonds, GICs and cash</b>		
Bonds	30%	10%
GICs	0%	18%
Cash	1%	4%
Total bonds, GICs, and cash	31%	32%
<b>Other assets</b>		
Real estate	4%	0%
Alternatives	4%	0%
Total other assets	8%	0%

While DC plan sponsors do not invest participant assets, they have several levers to influence participant asset mix. The place with perhaps the greatest potential to influence participant asset mix is the default option. Behavioral finance suggests that participants are likely to leave their contributions in the default option because of inertia. CEM research has shown that assets in an investment option, when designated as the default, were 2.3 times higher than assets in the same option when it was not the default.

Therefore, if a DC plan sponsor wants the asset mix of its participants to resemble the asset mix of a DB fund, then the DC plan sponsor should use a balanced fund option as the default option. However, Table 3 shows that the most common default options for most funds in the CEM database were GICs, stable value and cash.

**Table 3: Type of Default Option in 2005**

	% of Total
GICs/stable value/cash	53%
Balanced funds	34%
Other	13%

**Table 4: Matching Programs in 2005**

	% of Total
Cash	64%
Company stock	31%
Both	5%

Another important driver of the DC participant asset mix is the matching option. Again, if the intention is make the DC plan look more like a DB plan, then the DC sponsor should match with a balanced fund option or with cash and a balanced fund default. However, Table 4 shows that 31% of plans still match employee contributions with company stock.

The final key driver of the DC participant asset mix is the investment options offered. This impacts the DC plan participant asset mix in two ways. First, if an asset class is not offered, participants cannot invest in it. Table 5 shows that a large proportion of funds in the CEM database failed to offer several important asset classes.

Table 5: Plans Not Offering Key Asset Classes in 2005	
	% of Total
Real estate and REITs	84%
TIPS	92%
Alternatives	99%

Table 6: Investment Options in 2005	
	Median Number
Company stock	1
Domestic stock	6
Foreign stock	2
Bonds	1
Balanced funds	3
GICs/stable value/cash	1
Other	1
<b>Total</b>	<b>15</b>

Second, investment options impact asset mix based on the “1/n” behavioral finance rule. This rule describes naïve diversification whereby a participant allocates contributions evenly among the n investment options offered by the DC plan<sup>1</sup>. This may partly explain the low bond holdings of the average DC plan asset mix relative to the average DB asset mix. Table 6 shows that, in 2005, the average DC plan had 15 investment options but typically only one of these was a bond option. It is not surprising then that investments in this important DB asset class were relatively small.

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<sup>1</sup> Shlomo Benartzi and Richard Thaler, “Naïve Diversification Strategies in Defined Contribution Saving Plans,” *The American Economic Review* 91.1 (2001): 79-98.