

1 **Q. Evidence of Ms. McShane, relative risk adjustments, Pages 56-61: With reference**  
2 **to the statements on the CAPM that betas are the sole source of risk, please indicate**  
3 **any asset pricing model that does not include a beta or market factor. For example,**  
4 **would she accept that the Fama-French three factor model has a beta factor, that**  
5 **the Carhart model with momentum has a market (beta factor) that the Black two**  
6 **factor model has a market (beta) factor?**

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8 A. Ms. McShane has interpreted the reference to beta or market factor as an equity market  
9 beta or equity market factor. To clarify, Ms. McShane does not state that betas are the  
10 sole source of risk; rather, the application of the single variable CAPM assumes that the  
11 sensitivity of a stock to the equity market is the sole source of risk. With respect to  
12 whether there are asset pricing models which do not include an equity beta, the  
13 discounted cash flow model does not. Since one objective in the development of asset  
14 pricing models is an understanding of how fundamental macroeconomic sources of risk  
15 contribute to the prices of assets, most asset pricing models include an equity market  
16 beta, including each of the models referenced in the question. The application of the  
17 Arbitrage Pricing Model, however, which links asset prices to multiple macroeconomic  
18 factors, does not necessarily include an equity market beta as one of those factors. While  
19 the models generally are premised on investors being diversified, the Fama-French model  
20 includes factors that are firm specific: size and book/market values. The Carhart model,  
21 which adds momentum as a fourth factor, is also firm-specific. Note that it is not Ms.  
22 McShane's contention that the equity market is not a relevant source of risk; rather it is  
23 her contention that it is not, as is assumed by the single variable CAPM, the only source  
24 of risk. Multi-factor models, including those listed in the question, were developed in  
25 direct response to empirical studies of the single variable CAPM which concluded that  
26 the model did not work. See the discussion at pages A-17 to A-20 of Appendix A to Ms.  
27 McShane's testimony.