

Educational Endowments in Crises

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Whether measured by institutional failures, asset price declines, or shocks to the real economy, the financial crisis of 2008 is widely viewed as the worst since the Great Depression. The turmoil has been particularly acute for institutions that rely heavily on financial assets to fund operations. A recent Commonfund Institute study of 629 educational institutions in the U.S. found that, on average, the endowment provided 10% of operating budget support (Commonfund [2009]). The percentage of operating budget support provided by the endowment was higher (16.7%) for institutions with large endowments. Yale University reported in September 2009 that 42% of its budget came from its endowment funds.¹

The year-end update of the 2009 Commonfund study found that the average university endowment lost more than 24% in the market value of its assets over the period July 1, 2008, to December 31, 2008. Although the rebound in the equity markets in 2009 may have helped some schools' endowments recover, several large endowments still reported double-digit losses for the year ending June 30, 2009.² Consequently, some universities with large allocations to illiquid alternative asset classes disclosed that liquidity problems were a reason for basic changes in strategy and services. A natural question to ask is whether these effects on institutions will be long lasting, particularly if

the global economic recovery will be slow to materialize.

The turmoil of the 1930s offers one of the few opportunities to examine the longer-term effect of a major economic shock on educational endowments. How did that historic period of financial contraction affect endowments, and what lessons can be learned? In this article we review data from previous studies on educational endowments that extend back to the 1920s. We examine allocation policies from the early 20th century and explore their effects on asset values and endowment spending. A few striking features emerge from our analysis.

First, just as is the case today, the income generated by endowments declined significantly—by roughly 17%—in the 1930s. Second, equity investment by endowments actually increased in the 1930s following a low point in 1932. On the one hand, increased equity investment may have been an intentional policy based on financial research about the equity risk premium and concerns about inflation risk. On the other hand, the increase in equity investment may have been unintentional, the result of the widespread defaults, foreclosures, and bankruptcies that decimated fixed income and real estate during the 1930s. Third, in the 1920s and 1930s both small and large endowments had significant policy differences, just as they do now. Small endowments invested relatively more in real estate

and mortgages, both of which suffered severely in the Great Depression.

Among the many similarities between the two eras, we note important differences as well. The legal and regulatory environment in the 1920s and 1930s was vastly different from the current regulatory environment. Endowments were managed under dictates of trust law that required managers to maintain the principal value of their funds in nominal terms and forbade spending other than “natural income,” which comprised interests, dividends, rents, and royalties. Thus, most endowments were invested to maximize income, leading to heavy investment in fixed-income securities and other income-producing assets. Senior managers in the 1920s and 1930s had grown up during or just following the Panic of 1907 and World War I, two events that changed the financial landscape and which have no parallels in the experience of today’s generation of managers. Therefore, despite the huge run-up in stocks during the late 1920s, many managers likely remained risk averse; the legal environment was an additional constraint. It was not until the late 1970s and early 1980s that the modern endowment model began to be widely adopted. The endowment model employed broad diversification, invested for total return with a strong equity bias, maintained a low cash allocation, and spent a percentage of total return.

The parallels between 2008 and the 1930s extend, however, beyond market shocks. The modern endowment model has recently undergone a paradigm shift away from publicly traded securities toward alternative assets. During our study period, a similar change in thinking occurred when endowments were faced with the decision to embrace “new era” equity investing despite serious market declines. At the same time, diversification was a somewhat novel and widely discussed goal. Concerns about inflation and erosion of real spending power were also salient in the 1930s.

In this article we consider whether the adoption of a new philosophy of investing benefitted endowments during the Great Depression and, if so, whether it provides a useful decision framework for today’s managers. Despite the fact that asset allocation models typically rely on assumptions of long-term stationarity, managerial decisions are made in the context of change and of Knightian uncertainty. How much to embrace new thinking about markets and how much to rely on historical statistical evidence is a perennial trade-off for managers. Endowment managers today, as in the 1930s, must not only calibrate

their risk tolerance, but they must also calibrate their uncertainty tolerance, that is, the extent to which they can commit to an investment strategy with only slim statistical evidence to rely on. With this broader perspective, let us turn to the data on endowments from the 1930s.

ENDOWMENTS 1926–1941: ASSET ALLOCATIONS AND INCOME RETURNS

We use two main sources for our data: Wood, Struthers & Company and the American Council on Education Studies. Both sources are aggregate reports produced for the purpose of determining trends in endowments at different points in the early 20th century.

Wood, Struthers & Company

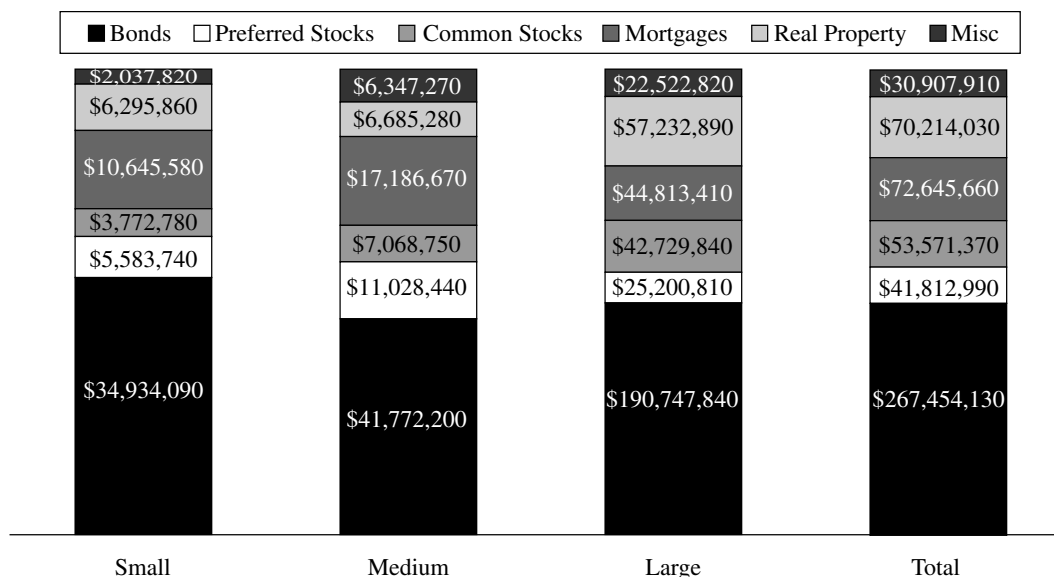
The first data source is an analysis of university endowments published in 1932 by the investment advisory firm Wood, Struthers & Company. The study (hereafter, the WS study) was motivated by the financial crisis that occurred over the period 1929–1931. The study sample covered the 30 top university endowments in the U.S. at that time, representing 74% of educational institutions with assets exceeding \$5 million. The sample was thus heavily oriented toward large institutions. The WS study divided the endowments into three groups by size and reported summary figures. Remarkably, the study gathered individual security-level data for 6,707 individual securities and used then-current price lists to estimate the market values of the securities. The market value of the sample as a whole was \$536 million. Exhibit 1 summarizes the WS study.

The asset classes in the WS study are bonds, preferred stocks, common stocks, mortgages, real property, and a miscellaneous category. The study reported bonds, stocks, and preferred shares at market value, and real estate, mortgages, and miscellaneous assets at “stated” value, which is likely their cost. Fixed-income or fixed-income-like securities made up the highest proportion of endowment assets, and within this classification the largest allocation by number of issues was to railroad bonds and utilities, as shown in Exhibit 2.

Most equities in the 1930s endowment portfolio were industrials, reflecting the core of the U.S. economy at the time (Exhibit 2). The small allocation to equities on a market value basis may be the result of the dramatic decrease in equity market values following the stock

EXHIBIT 1

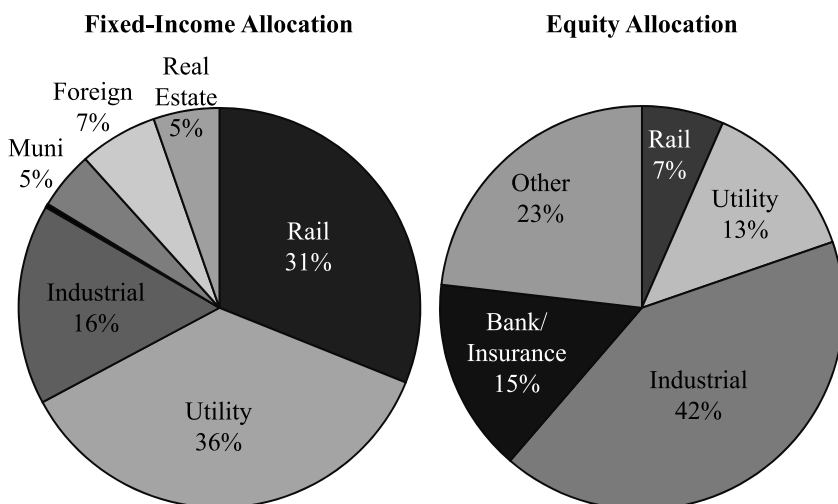
Aggregate Market Value of 30 Major U.S. University Endowments by Asset Class, 1932



Source: Wood, Struthers & Co. [1932].

EXHIBIT 2

Aggregate Endowment Fixed-Income and Equity Allocations, 1932



Source: Wood, Struthers & Co. [1932].

market crash in 1929. Prices had declined by more than 50% from their highs, so the small percentage of equity investment shown in Exhibit 1 may not represent policy. Mortgages, real estate, and miscellaneous assets represented about 30% of the total 1930s endowment portfolio. These

instruments were presumably generating bond-like cash flows and, like bonds, were subject to default risk.

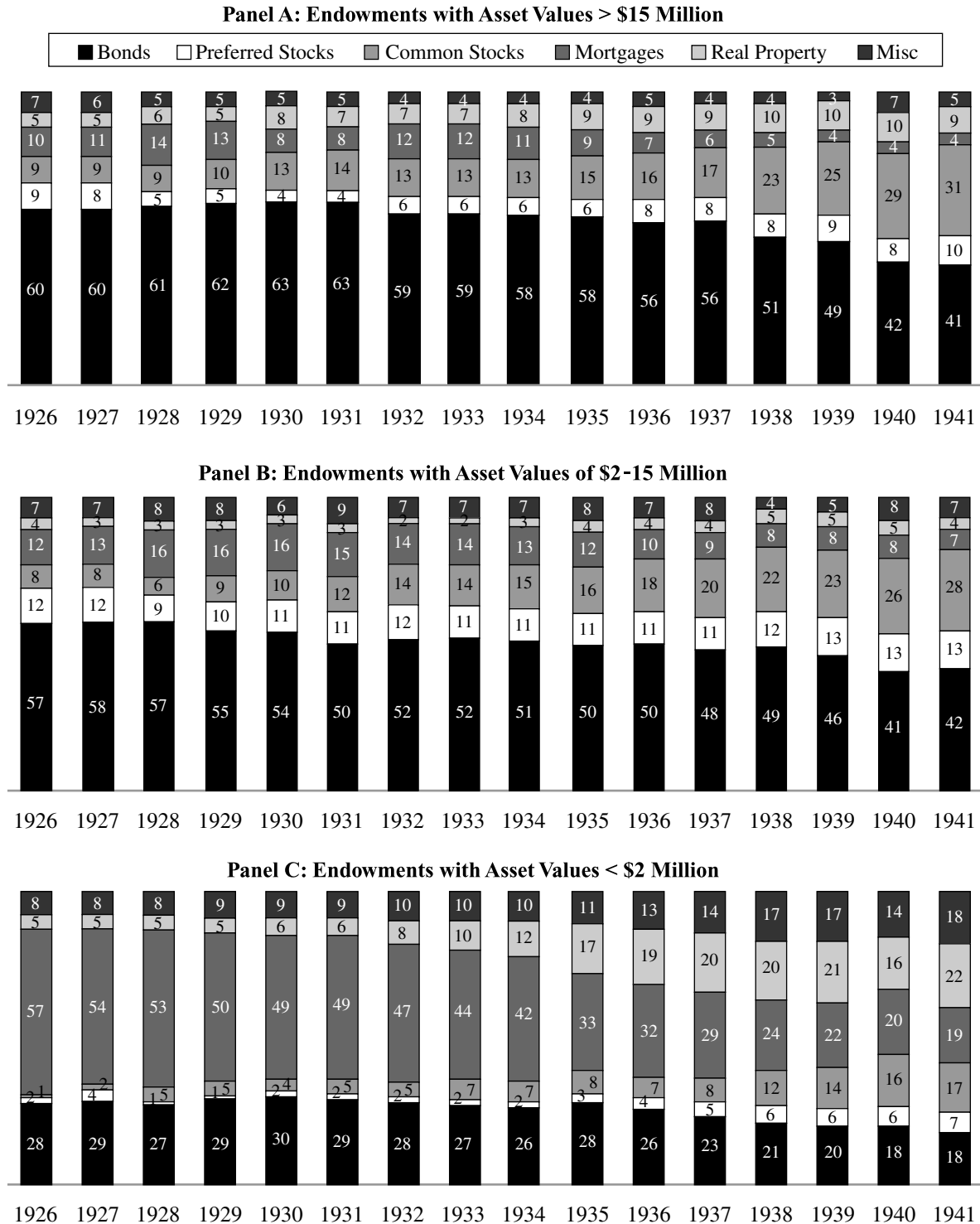
American Council on Education Studies

A comprehensive survey of university endowments was undertaken by Cain [1942] for the American Council on Education Studies (ACES). The survey tracked the finances of 45 private universities in the U.S. over the period 1926–1941 and included detailed allocation information for a larger sample of 120 institutions over the period 1938–1941. The sample covered virtually all of the largest college endowments in the country at that time and thus provides time series data that allow us to follow the endowment allocations through the Depression.

Exhibit 3 reports the time series of average asset allocations according to cost value for the ACES sample, divided by asset size. Because securities were added to (and subtracted from) the portfolio at their historical cost,

EXHIBIT 3

Endowment Asset Allocations, 1926–1941



Note: Historical cost-weighted allocations.

Source: ACES study by Cain [1942].

the relative increase could be due either to purchases of securities or to decreases in holdings of other securities. By the same token, decreases in relative value could be due to 1) sales of securities; 2) call, maturity, or default of securities; or 3) purchases of securities in other asset classes. Therefore, the changes can be viewed as rough approximations of relative allocations, but they were affected by the timing and market value of purchases and sales. With these caveats, what do we learn from the trends?

The general trends in the ACES study are consistent with the one-year snapshot of the WS study. Large endowments, those with more than \$15 million, held 60% of their portfolios in high-quality (AAA- and AA-rated) bonds. Bond yields outperformed equity income returns during the period 1929–1932, as shown in Exhibit 4. After the crash of 1929, corporate bond yields spiked to a peak of 9% in 1932, while equity income returns drifted between 5% and 6% for those companies that were still paying dividends. The time series shows that the large endowments increased common stock holdings from 9% to 16% of their portfolios, based on cost value, over the period 1929–1936. Mortgages and real estate combined accounted for 14% to 18% of the average large endowment portfolio.

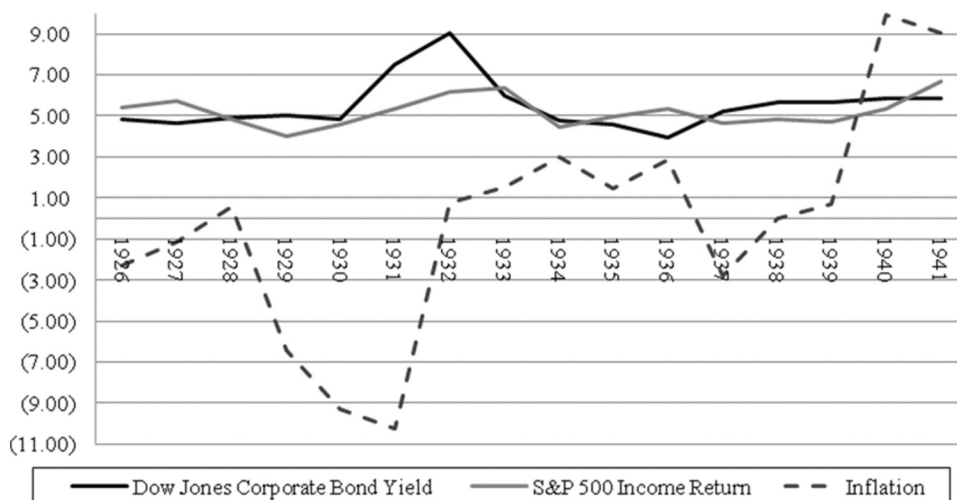
Mid-sized endowments of \$2 to \$15 million maintained a similar asset allocation strategy to that of the large endowments. Bond holdings accounted for 60% of mid-sized endowment portfolios in 1926, decreasing to

40% in 1941. Common stock investments climbed from 7% to 27% of the average portfolio, and preferred stock remained stable at 11% to 12%. The main difference between mid-sized and large endowment allocations was that mid-sized endowments invested more in mortgages and less in real estate, but the combined percentage remained close to 10% to 14% of their respective portfolios.

Small endowments of under \$2 million pursued a different strategy, perhaps due to the respective schools' lesser reliance on income from the endowment. Small endowment portfolios had a high concentration in mortgages, ranging from 56% in 1926 to 18% in 1941. Real estate and mortgages combined accounted for 40% to 60% of their portfolios, with real estate investments gradually replacing mortgages, evidently through the process of default and foreclosure. This resulted in lower income returns for small endowments compared to larger endowments.

The growth in equity investing during the Depression is the most noteworthy feature of the ACES report. In a period remembered for the terrible performance of the U.S. stock market and widespread bond defaults, evidence suggests that endowments were buying. This may have been due to the prevalent investment philosophy at the time. Commentators from the 1920s noted that equity security selection and asset allocation by endowments was based on principles of value investing. According to Arnett

EXHIBIT 4
Bond Yield, Equity Income Return, and Inflation, 1926–1941



Source: Global Financial Center and Ibbotson Yearbook.

[1922], stocks were assessed on the following set of fundamental principles: 1) little or no debt, 2) common stocks secured by the company's assets, 3) large margins of surplus, 4) accumulating dividends at a fixed rate, and 5) regular dividend records over long periods of time. All of these principles are hallmarks of the value investing approach later articulated by Graham and Dodd [1934]. Some endowments adopted a value-based contrarian investment approach. Vassar College, for example, used a trading rule based upon the intrinsic value of the Dow Industrials. Using the 135 level of the DJIA as a reference point, the endowment purchased equities when the Dow fell under 135 and sold equities when the Dow rose above 135. MIT, Yale, and other universities also apparently applied a similar contrarian strategy (Cain [1941]). This approach may have contributed to the growth in allocations to equities following the market's low point in 1931.

Another incentive for the movement toward equities might also have been yield. As high-quality bond yields drifted lower in the late 1930s, many higher-education endowments sought to protect their income by increasing their holdings of preferred and common stocks (Moulton et al. [1940]). By 1941, as Exhibit 4 illustrates, high-quality bond yields were 5.8% and the income return on stocks averaged 6.7%.

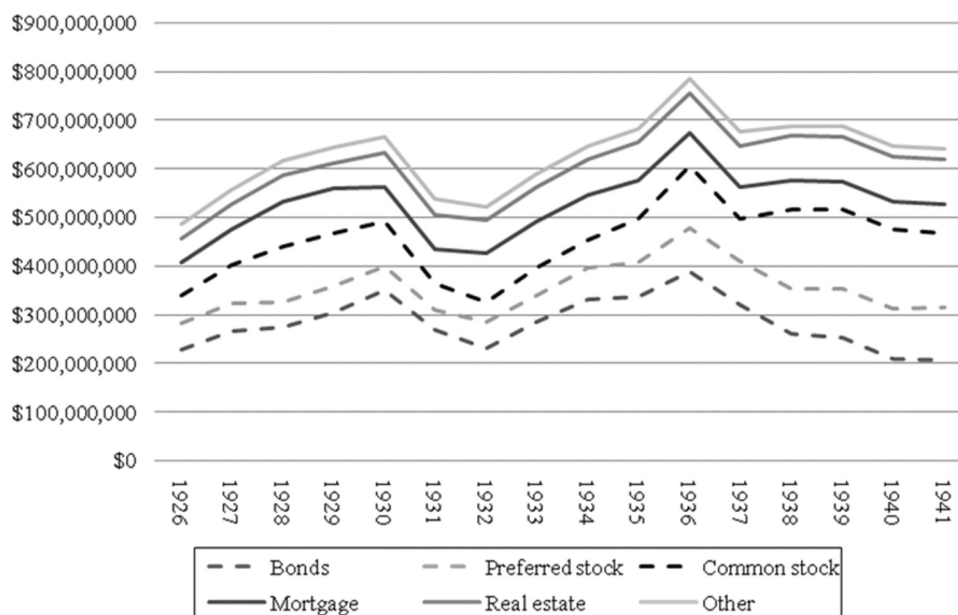
Market Value

The limitation of the ACES study is that, by the convention of the era, the data are at cost rather than at market value. Thus, in order to estimate market value trends we have to merge the two datasets and use historical indices of asset class capital appreciation.

Exhibit 5 is constructed by using the total market value of assets from the 1931 sample and the annual change in cost-based value for each asset class in the ACES longitudinal study. The equity holdings for 1933, for example, are equal to the market value of equities at the end of 1932 plus the increase in book value in 1933 times the capital appreciation of the S&P 500 Index over the period. For bonds, because utility bond and mortgage bond indices did not exist during our study period, we equal-weight the capital appreciation of railroad bonds and industrial bonds to 1938 and use industrial bonds after 1938. For preferred shares, we use the change in the S&P index of preferred stocks for that year. For mortgages, real estate, and miscellaneous we do not calculate market value, but simply use the change in the cost value. Although this understates the variation due to changing asset prices, it at least captures the effect of donations, sales, and asset write-downs.

Exhibit 5 is a stacked-line graph of the estimated market values derived from this procedure. Thus, the

EXHIBIT 5
Estimated Market Value of Major U.S. College Endowments, 1926–1941



uppermost curve in the chart represents the total asset value through time. 1932 is the low point in the sample. After this, the cumulative market value of endowments did not reach the previous 1930 high water mark in nominal terms until 1935. Although the stock market had dropped to less than 50% of its peak value by 1932, the decline in endowment values was less, about a 22% loss in value from its peak, which is remarkably similar in magnitude to the current endowment crisis. By March 2009, the S&P 500 had dropped to 56% of its peak, whereas the market value of the average Commonfund Institute study portfolio declined less than 25% from its 2008 peak.

The market value of the equity component in Exhibit 5 is consistent with the cost value trend observed in the ACES study. The allocation to common stock dramatically decreased from a high of 14% in 1931 to a low in 1932, but increased to roughly 25% by the end of the sample.

Income Returns

Income trends for the sample of 45 endowments over the time period are reported in Exhibit 6. Income grew with the addition of income-paying securities to the endowments and with the increase or decrease in dividends. The growth in endowment income in the late 1920s was dramatic, increasing by more than 50% by 1931. Endowment funds supported a significant portion of educational institutions' operating budgets; for example, 52% of Stanford University's operating budget and 32% of the University of Chicago's operating budget came from

endowment income (Badger [1935]). It is somewhat surprising that endowment income continued to grow after the crash of 1929, but by 1934 endowment income had decreased by 17% and did not regain its former high water mark until 1941. Thus, the effect of the Depression on university endowments was to cut their income to pre-crash levels. The contraction in the 1930s was therefore not particularly severe for institutions that did not rely heavily on their endowments for income, but for heavily endowment-reliant schools a 17% drop was not trivial.

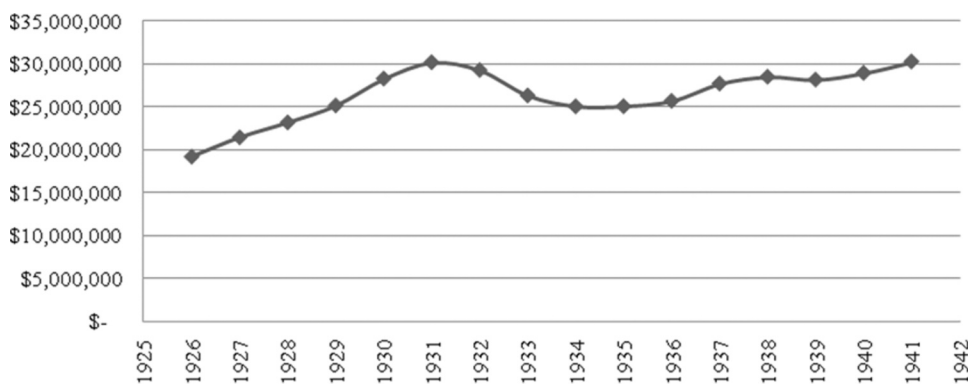
The combination of the loss in market value and the decline in income for endowments over the study period is strikingly similar to the scale of the current endowment crisis and was recognized in the 1920s and 1930s as a severe problem for some institutions. The discussion at that time is of particular interest to us today because not only were the Depression-era asset and income trends similar to those in observance today, but a shift in investment theory was confronting endowment managers then as now.

New Era Investing

Interesting parallels exist between the environment of the early 1930s and today. First, the shock to markets caused a sense of alarm and concern for institutional survival in both eras. According to Cain [1942] in the ACES study:

We are facing a situation today where the very survival of some institutions is at stake. So many things today are subject to change we almost come to the conclusion that we must prepare for changes in everything (p. 8).

EXHIBIT 6
Income Returns of Major U.S. College Endowments, 1925–1941



Source: ACES study by Cain [1941].

The quote alludes also to the second parallel—a sense of change—a theme also familiar to modern endowment managers. Over the past decade the paradigm for endowment investing has shifted from an emphasis on long-only marketable securities to a portfolio composed of alternative asset classes including nonmarketable securities, hedge funds, and commodities. This change has occurred despite little long-term empirical evidence about the risk and return of an alternatives-based portfolio. Although strong arguments have been made for the benefits of this new model—including the potential to add risk-adjusted return in inefficient markets and the potential to profit from an illiquidity, or “patient investor,” premium—endowment managers are faced with a decision that involves a dramatic change in investment policy, portfolio construction, and management. A similar revolution in investment philosophy occurred in endowment management in the 1930s. The new paradigm then focused on the equity premium, a theory that developed out of empirical work in the 1920s.

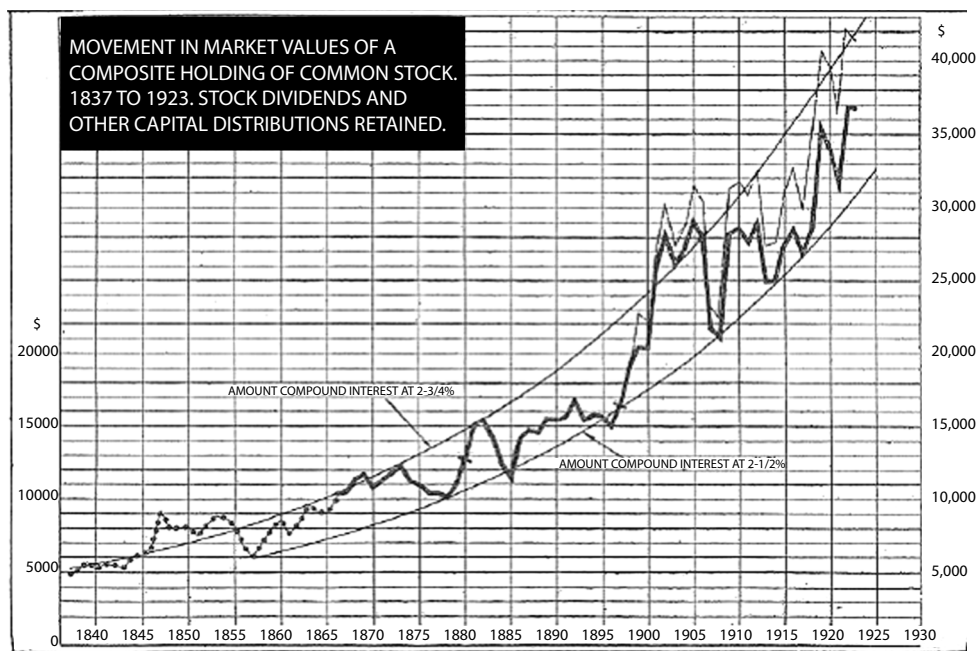
Equity Investment

Equity investment by institutions was regarded as a somewhat novel idea in the 1930s. The WS study in 1932 alluded to the “over-emphasis...placed on the common stock theory during the ‘new era’ of 1927–1929” (p. 30). The common stock theory that was being referred to is the proposition that was tested and promulgated by Smith [1924]. Smith used historical data on debt and equity securities from 1866 through 1923 to demonstrate the existence of an equity risk premium. He also traced the U.S. equity market back further than 1866 to understand the long-term trend.

Exhibit 7 shows the total return to investing in the U.S. stock market over the 85-year period from 1837 to 1922. These data provided by Smith [1942] are the first academic attempt to quantify equity returns from an investor’s perspective and offers a compelling argument for growth-oriented investing. Smith’s evidence and similar empirical research convinced Yale professor Irving Fisher that equities returned more than bonds and preserved real value in the long term. According to Fisher [1930],

EXHIBIT 7

Total Return in the U.S. Stock Market, 1837–1922



Source: Smith [1924].

[s]tudies of various writers, especially Edgar Smith and Kenneth Van Strum, have shown that in the long run stocks yield more than bonds. Economists have pointed out that the safety of bonds is largely illusory since every bondholder runs the risk of a fall in the purchasing power of money and this risk does not attach to the same degree to common stock, while the risks that do attach to them may be reduced, or insured against, by diversification (pp. 220-221).

The empirical evidence presented by Smith and Strum was by no means generally convincing. The fundamental premise of endowment management at the time was that of preservation of capital and the avoidance of risk. The recommendation that a university ought to devote a significant share of its endowment to plainly riskier securities seemed simply imprudent. It took a long-term study to demonstrate its potential efficacy. Nevertheless, despite the statistical evidence it required a leap of faith. The commitment to increasing equity investment must also have been doubly difficult for endowment trustees following the crash of 1929, and the dramatic erosion in market values. In the following section we explore the effects of the “new era” equity orientation.

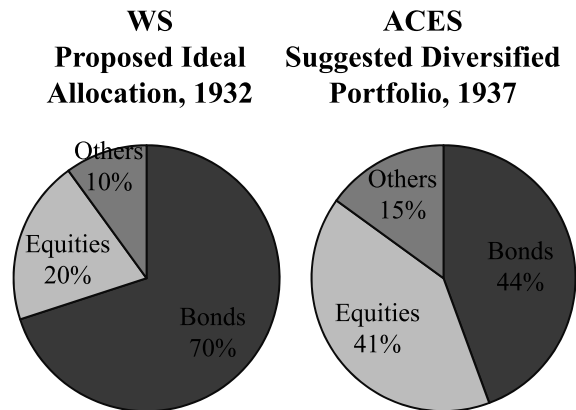
1925–2008: ENDOWMENT PORTFOLIO SIMULATION

In this section, we will discuss the results of back-testing allocation policies that were recommended in the 1930s and 1940s. Our goal is to consider, ex post, the effects of the adoption of the new era equity orientation towards equities. We use the following methodology to create an educational endowment portfolio simulation from 1925 to 2008.³ We assume an investment of \$100 at the end of 1925, shortly after the study by Smith [1942], and consider four portfolios: all equities, 50% equities/50% bonds (50:50 Mix), 20% equities/80% bonds (20:80 Mix), and all bonds. The 50:50 Mix is based on the 1937 ACES proposed target allocation and the average cost value allocation of large endowments in 1940 and 1941. The 20:80 Mix reflects the 1932 WS study’s suggested ideal allocation and the average cost value allocation of large endowments over the period 1926–1931. These allocations are shown in Exhibit 8.

For the 50:50 Mix and 20:80 Mix, we further examined the difference between rebalancing annually to the target allocation (Rebal) and no rebalancing (No-Rebal).

EXHIBIT 8

Target Asset Allocations in 1932 and 1937



Source: Wood, Struthers & Co. [1932] and ACES study by Seass [1937].

Rebalancing represents a contrarian strategy, which we know some endowments used, and no rebalancing lets the portfolio drift with market movements.

We assumed two spending rules in the simulation. Spend all the investment income (Spend Income) and spend 4.5% of the three-year moving average market value (Spend Moving Avg.).

Data sources are the Ibbotson Yearbook S&P 500 Total Return and Income Return and the U.S. Long-Term Corporate Bond Total Return and Income Return from 1925 to 2008. We assumed a management fee of 0.5% of total asset value and a transaction fee of 0.5% of the trading amount for both buy and sell transactions. The detailed formulas follow:

$$\text{Ending portfolio value } V_1 = \text{Beginning portfolio value } V_0 \times (1 + \text{Asset total return}) \times (1 - \text{Mgt. fee } \%) - \text{Spending} - \text{Rebalancing cost}$$

$$\text{Spend income} = \text{Beginning asset value} \times \text{Asset income return}$$

$$\text{Spend moving average} = \text{Beginning portfolio value } V_3 \times (4.5\% \text{ of previous three-year moving average portfolio value } V_{1-3})$$

$$\text{Rebalancing cost} = (\text{Purchased asset value} + \text{Sold asset value}) \times \text{Transaction fee } \%$$

The results of the simulations are shown in Exhibits 9 and 10. As theory would predict, over the long term, the equity risk premium prevails. The all-equities portfolio created the highest portfolio value and spending amount over 83 years for both rules: spending

EXHIBIT 9

Logarithms of Endowment Portfolio Values, 1925–2006

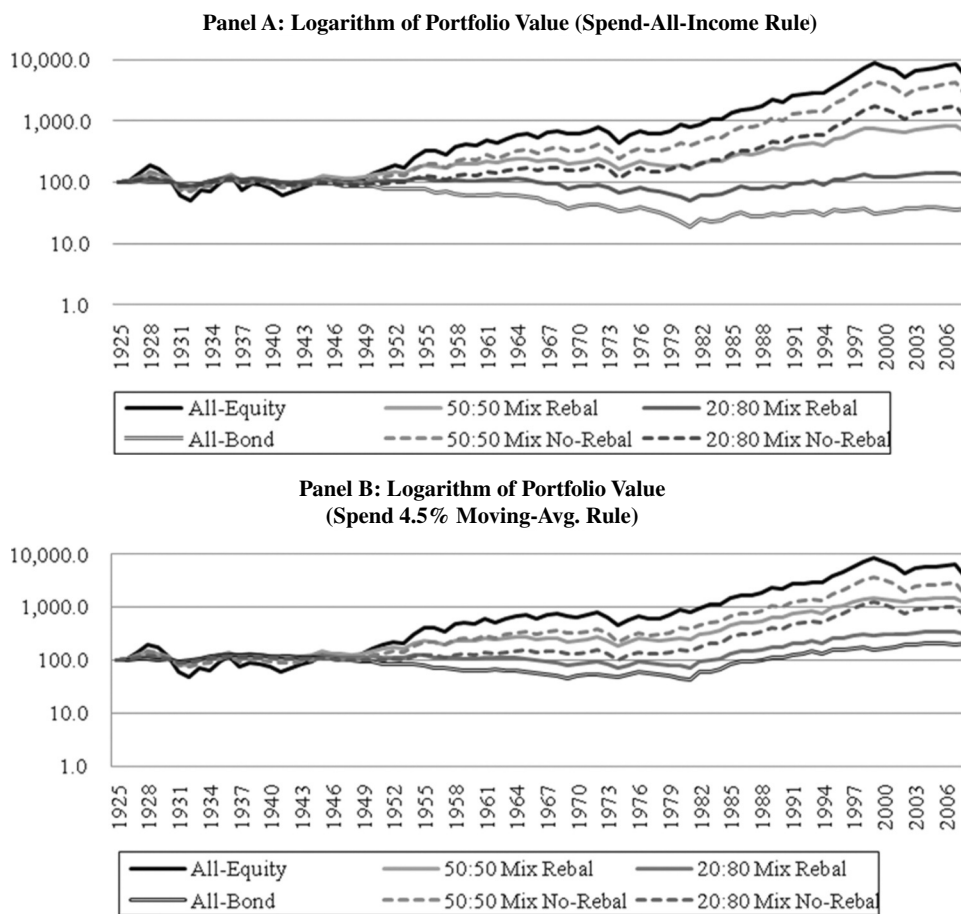


EXHIBIT 10

Endowment Annual Spending Amount, 1925–1950

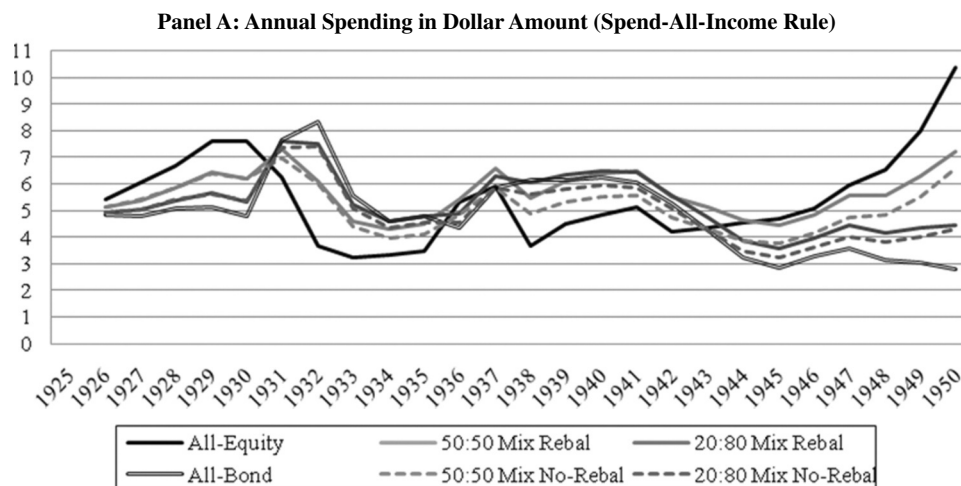
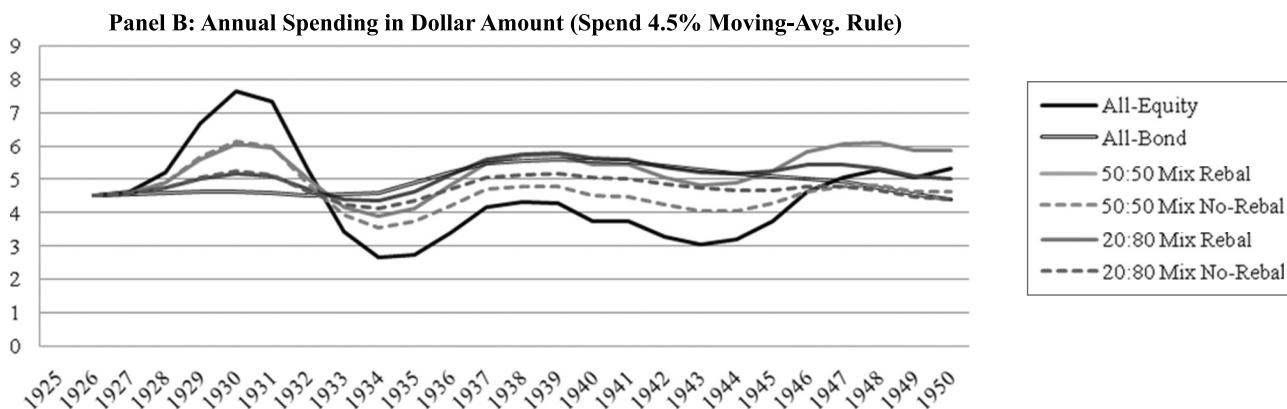


EXHIBIT 10 (continued)



all income and spending 4.5% of the three-year moving average market value. The all-equities portfolio value was \$8,000 in 2007 and \$5,000 in 2008 under the spend-all-income rule, and \$6,000 in 2007 and \$3,000 in 2008 under the moving-average spending rule. At the end of 2008, the all-bonds portfolio had a value of only \$36 under the spend-all-income rule and a value of \$200 under the moving-average spending rule. The more equities the portfolio held, the higher the portfolio value and spending it achieved in the end.

Since the 1980s, the moving-average spending rule has provided all types of portfolios a higher spending amount than the spend-all-income rule, because the moving-average rule preserves some income and reinvests it. The no-rebalancing portfolios have more equity holdings than the corresponding rebalancing portfolios due to appreciation in equities. We were also interested in knowing how long the portfolio market value took to recover after the 1929–1931 crisis and to determine when the spending amount rebounded back to its pre-crisis level.

The market value of the Commonfund Institute study portfolios declined from \$321 billion in 2008 to \$244 billion in 2009. Our study results show that not until 1945, at the end of World War II, did the simulated portfolio value recover to the full 1925 level, although there was an increase in 1936. World War II prolonged the period of recovery for a total of 16 years from 1929 to 1945. During this time, the all-equities portfolio value dropped to only 48%–50% of its prior value (spending all income/moving-average spending) in 1932 and was underwater for the 13 years that followed. Surprisingly, the 50:50 Mix Rebal portfolio outperformed the all-equities portfolio during this period. The 50:50 Mix

Rebal portfolio value bottomed out at 74%–77% (spending all income/moving-average spending) in 1932 and was underwater for only 6 years. Although a diversified portfolio may not have generated the highest total returns as did the all-equities portfolio, it did mitigate the decline during the volatile times of the Depression.

Under the spend-all-income rule, the all-equities portfolio annual spending amount shrank from a range of \$6.0–\$7.30 over the period 1927–1931 to a range of \$3.20–\$3.70 over the period 1932–1936. In contrast, the annual spending of the 50:50 Mix Rebal portfolio fell short of \$4.50 only in 1934. Under the moving-average spending rule, the annual spending of the all-equities portfolio was below \$4.50 from 1933 to 1945, once dropping to as low as \$2.60. The annual spending of the 50:50 Mix Rebal portfolio was in the range of \$3.90–\$4.20 for only the three-year period from 1933 to 1935.

The equal-weighted portfolio had certain attractive characteristics, but the low-weighted equity portfolios (20%/80% and 0%/100%) did not; they failed to smooth income significantly, and they failed to preserve value. The policy of spending all income is particularly telling. The portfolio experienced considerable variation in income during the early 1930s and then failed to preserve value, lagging behind by 1945.

Running this simulation in real terms, the all-equities portfolio value was \$3,000 in 2007 and less than \$2,000 in 2008 under the spend-all-income rule, and \$5,000 in 2007 and \$3,000 in 2008 under the 1.5% moving-average spending rule.⁴ At the end of 2008, the all-bonds portfolio had a real value of only \$24 under the spend-all-income rule and a real value of \$160 under the 1.5%

moving-average spending rule. The most dramatic financial event of the 1920s was the post-World War I hyperinflation in Germany, a phenomenon that raised the specter of the complete destruction of real savings following the erosion of the gold standard. Although the U.S. avoided the extremes of inflation suffered by Germany, the simulation in real terms showed the all-equities portfolio produced better results than the all-bonds portfolio. Had world events been different, the U.S. could have also faced a hyperinflation scenario that would have destroyed endowments heavily invested in nominal fixed-income securities.

CONCLUSION

The 1930s was a terrible time for university endowments because market values declined and investment income shrank. This period was perceived as a crisis. The challenges for endowment trustees were particularly difficult in the 1930s, because many were faced with the decision of whether to move toward an increased equity allocation. Some, in fact, had likely already done so by 1929 when the stock market crash occurred. Despite the advice of the leading academic researchers at the time, a policy of increased equity investment must have been difficult to propose or to maintain to fellow trustees in the midst of unprecedented financial turmoil. Ex post it was the right thing to do, and our analysis suggests that many endowments had the courage to pursue this policy. Our simulations demonstrate the long-term benefit of the risks they took in the face of uncertainty.

Endowment managers today face similar issues. The important role of equity investing has long been accepted. Legal changes have made it feasible, as equity dividends have declined, to spend capital gains as well as income. Instead, today's endowment managers face the question of whether their recent foray into alternative investments has been wise and whether it should be continued. The empirical evidence on the long-term performance of many of these asset classes is scant. It is a moment when sound, reasoned judgment is paramount.

ENDNOTES

¹Press Release, Office of Public Affairs, Yale University, September 22, 2009. Available at <http://opa.yale.edu/news/article.aspx?id=6899>.

²Yale reported a loss of -25%, Harvard, -27%; Stanford, -27%; Columbia, -21%; Penn, -15%; and Duke, -24%.

³We use the method adopted by Thaler and Williamson [1994] to examine the efficacy of an all-equity portfolio.

⁴1.5% = 4.5% nominal average spending rate minus 3.0% long-term average inflation.

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