

A New Approach to Financial Planning

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March 31, 2005



❖ The Rockwell Family

- The Rockwell Family
 - Anthony, a 50-year-old mid-level financial services executive.
 - His family:
 - Wife: Julie (aged 48)
 - Two children: Kerry (age 13) and Jake (age 10)
 - Lives in a 4-bedroom single-family home near a major financial center with 10 years left on the mortgage.

❖ Goals

- Kerry is definitely going to a top college. She loves horses and is dreaming of being a vet.
- Jake – too soon to tell.
- Anthony is planning to retire at age 65.
- Julie wants to move to a smaller house in Arizona when Anthony retires.
- Meanwhile, the mortgage needs to be paid...

Resources

- A 4-bedroom suburban home
- Maximum Social Security benefit during retirement
- \$300,000 in a 401(k) plan
- \$100,000 in taxable investments
- Expects to inherit \$250,000 over next 10 years

❖ Typical Advice

- “Tony, you are a moderate investor!”
- Moderate investors in a similar situation should hold 60% equity, 40% bonds
 - If Tony is lucky, it is implemented as an ETF portfolio with an embedded management fee of 30 bps
 - If Tony is unlucky, the embedded management fee might be 300 bps
- The allocation is non-controversial, diversified, and “won’t get you into trouble.”
- Drivers of the standard planning process
 - Deterministic models, static assumptions, cash-flow orientation, limited view of the investor’s balance sheet

❖ A Typical “Moderate” Allocation

401(k) Account

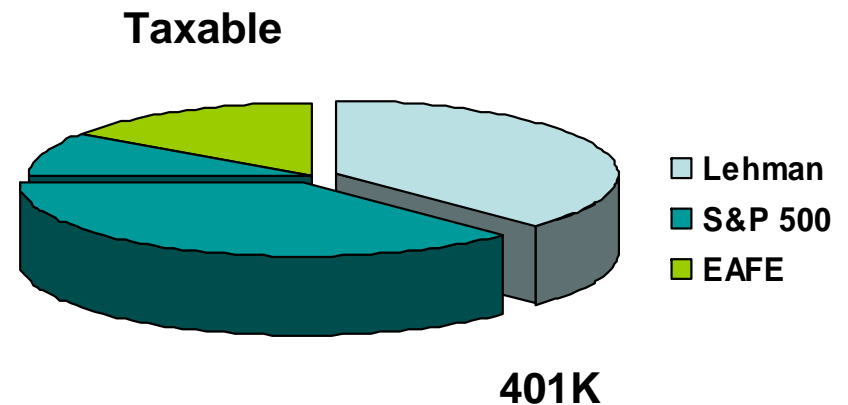
Lehman Aggregate	\$150,000
S&P 500	\$150,000

Taxable Account

S&P 500	\$40,000
EAFE	\$60,000

Analysis

Domestic Equity	48%
International Equity	15%
All Equity	63%
Fixed Income	37%



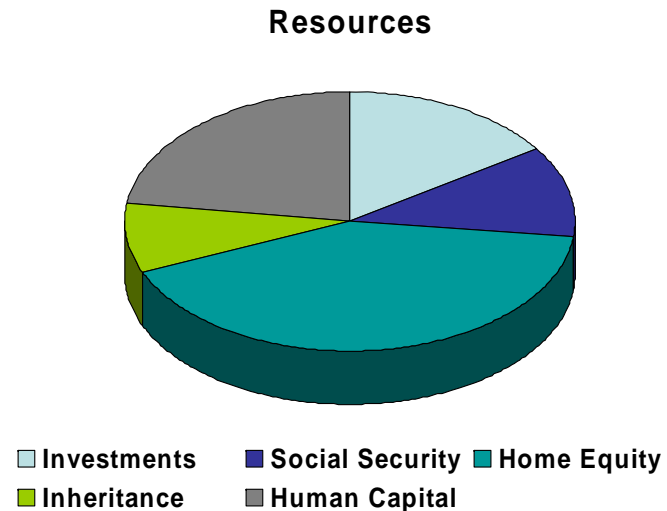
❖ Questions

- What if Anthony isn't sure he's a moderate investor?
- The advice is standard and probably safe, but is it the best advice?
- Can the Rockwells do better?

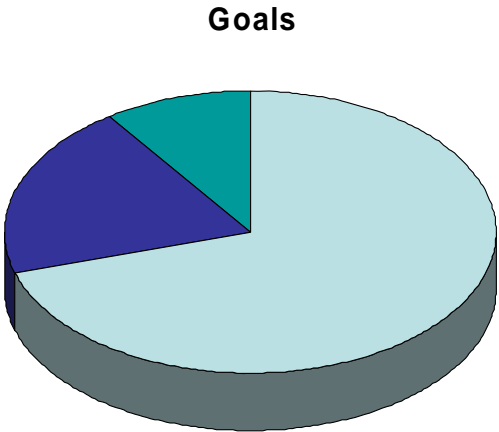
Let's start with a better description of their circumstances:

❖ The Rockwells' Balance Sheet: Resources

Resources	
<i>401(k) Fund</i>	
Securities	300,000
Deferred Tax	(30,000)
Net Value	270,000
Taxable Account	100,000
All Investments	370,000
Social Security	275,000
<i>Home</i>	
Market Value	1,500,000
Mortgage	(424,000)
Deferred Tax	(81,000)
Net Home Equity	995,000
<i>Human Capital</i>	
Base Salary	257,000
Bonus	289,000
Net Human Capital	546,000
Prospective Inheritance	200,000
TOTAL RESOURCES	2,386,000



❖ The Rockwells' Balance Sheet: Goals



□ Retirement ■ Education ■ Net Resources

Goals

<i>Retirement</i>	
Income	1,178,000
House in Arizona	500,000
Total Retirement	1,678,000

<i>Education</i>	
Kerry	250,000
Jake	116,000
Reserve for Jake	110,000
Total Education	476,000

TOTAL GOALS 2,154,000

NET RESOURCES 232,000

❖ The Fixed Income Component

- A fairly exotic portfolio

Side	Item	Value (\$)	Modified Duration
Short	Mortgage	(424,000)	5
Short	Deferred Taxes	(111,000)	28
Long	Lehman Aggregate	150,000	4.5
Long	Social Security	275,000	22
Long	Mortgage Prepay Options	8,400	n/a
		(101,600)	25.4

- Appropriately complex dynamics

Scenario	Due to	Change Value	Return (%)
Treasury rate rises 100bp	Change in real rate	(\$30,400)	-35
	Change in inflation	\$30,600	38
Treasury rate falls 100bp	Change in real rate	\$59,600	74
	Change in inflation	(\$400)	0

❖ The Equity Component

Equity Portfolio

<i>Item</i>	<i>Value</i>	<i>Weight</i>	<i>Finance Sector Exposure</i>
S&P 500	190,000	35%	20%
EAFE	60,000	11%	0%
Salary, bonus component	289,000	54%	100%
	539,000		

Alert: Total weight in
finance sector is 61%!

❖ Risk Analysis

- Value at Risk is \$226,000, which is large by comparison with net resources of \$232,000.
- Almost 70% of risk is derived from bonus compensation.
- Investments contribute only 6% of risk.
- Although the house is the largest asset, it actually reduces risk by 1%.
- The retirement goal is responsible for 25% of the Rockwells' risk.

❖ Some Observations

- Focus on earning the bonus!
- Fussing about whether the portfolio should be moderate or moderate aggressive is not important.
- Bigger issue – use the portfolio to earn return or to hedge real assets?
- Radical idea – use part of regular assets to buy puts on the finance sector.
- Less radical ideas
 - Restructure fixed income component (probably more TIPS)
 - Shift domestic equity to S&P500 ex-finance
 - Increase EAFE to reduce finance exposure and correlation
 - None of these would result from a traditional approach
- Realize that the balance sheet will shift a lot over five years and that the portfolio needs to adapt.

❖ The Rockwells' Balance Sheet – 5 Years Hence

Resources		Goals	
401(k) Fund		Retirement	
Securities	440,000	Income	1,473,000
Deferred Tax	(50,000)	House in Arizona	625,000
Net Value	390,000	Total Retirement	2,098,000
Taxable Account	520,000		
All Investments	910,000	Education	
Social Security	295,000	Kerry	312,500
Home		Jake	145,000
Market Value	1,725,000	Reserve for Jake	137,500
Mortgage	(181,000)	Total Education	595,000
Deferred Tax	(131,000)	TOTAL GOALS	2,693,000
Net Home Equity	1,413,000		
Human Capital		NET RESOURCES	286,000
Base Salary	170,000		
Bonus	191,000		
Net Human Capital	361,000		
TOTAL RESOURCES	2,979,000		

❖ A New Goals-based Framework – 5 Components

1. A comprehensive balance sheet view
2. Multiple-goal framework
3. Asset allocation and investment
4. Monte Carlo simulation to model portfolio behavior vs. goals
5. Dynamic recalibration over the investor's lifecycle

❖ A Comprehensive Balance Sheet View

- Comprehensive household view across all:
 - Investment accounts, products, assets, resources, liabilities, goals
- Resources and goals

Resources

Investments
Social Security
Home Equity
Human Capital

Total Resources

Goals

Debt Service
Retirement
Education
Bequest

Total Goals

- Focus on the **what** rather than the **how** of cash flow analysis
- A portfolio viewpoint
 - With associated concepts of exposures, risks, efficiency etc.

❖ Goals are Random: e.g., The Educational Goal

- “Send my son to Cornell”
- Cost = Present Value (Price x Quantity)
 - Present value reflects years to reach age 18
 - Price is annual tuition & board
 - Quantity is 4 years of college
- Price
 - Stochastic variable
 - Covariant with stock & bond prices
 - Can be modeled

❖ Asset Allocation and Investment

- Traditional Viewpoint
 - Investments considered in isolation from other resources
 - Risk budgeting approached psychologically
 - Focus on absolute return
- New Viewpoint
 - Consider investments in context of entire balance sheet
 - Risk budgeting based on impact of shortfall on goal realization
 - Create optimized, multi-period risk budget
 - Translate risk budget into a time series of efficient asset allocation models or model portfolios focus on achieving goals

❖ Dynamic Strategy

- Psychological risk budgeting
 - Leads to a static strategy since personality is stable
- Considering balance sheet and goals
 - Leads to a dynamic strategy since economic circumstances are in constant flux and goals may change
 - Enables dynamic management of investment strategies in different life stages

❖ Conclusions

- The Balance Sheet is informative!
- The portfolio of resources and goals is what needs to be managed, not the portfolio of investments.
- Irrespective of his day job, Anthony Rockwell is a hedge fund manager!
- This viewpoint offers much room for innovation in financial planning and a better client experience for the Rockwells.

Assumptions and Definitions

- Capital Market Assumptions: The mean asset return assumptions are 2% real rate on TIPs, 3% inflation, 5% bonds, 8% equities. Housing appreciates at the inflation rate.
- Taxes: Taxes are treated as federal plus state using federal rates of 15% on dividends and capital gain and 35% on ordinary income. The state rate is taken as 5% on all types of income. Deferred taxes are calculated by first projecting forward the value currently in hand to the point of tax realization, calculating the tax payment at that time and then discounting back to the present value. In projecting forward we consider the additional return to be earned by an asset from the present until the tax is realized, but we do not increase it by any additional cash flow into the asset which may occur over the deferral period. For retirement account assets we suppose account drawdown commences at retirement and each year a fraction is withdrawn based on remaining life expectancy (i.e. we follow the IRS minimum draw down rules.). For the house asset we assume sale at the time of retirement plus \$500,000 principal residence exclusion on capital gain.
- Other definitions: Actuarial analyses are based on standard life tables. The Social Security benefit is the actuarial present value of the maximum monthly benefit assuming inflation escalation. The house asset initially cost \$800,000 ten years ago and was financed 20% down with a 20 year conventional mortgage. Net human capital is the present value of savings made from salary income. Salary income is broken down into base and bonus. The base salary increases with inflation. The bonus is 30% of base. Various expenses (taxes, living expense, and mortgage) are charged against salary and the balance is the saving flow that is valued. The inheritance is a one time lump sum cash inflow occurring at a random date over the next ten years, (For the purposes of the five year forward balance sheet, we assume the inflow occurred in the fifth year.) The retirement income goal is calculated so that the couple maintains its disposable income after taking into account 1) change in taxes 2) elimination of salary 3) elimination of mortgage and saving commitments. Kerry's education goal is calculated based on the cost of 4 years of private college followed by 4 years of professional graduate education with college commencing in 5 years. Jake's education goals are treated as 4 years of private college and a lump sum in the fifth year with his college beginning in eight years. Educational expenses increase at the rate of inflation plus 1%.
- Stochastic properties: Securities are modeled based on monthly return series which are aggregated into quarterly return series. Housing and education are based on returns derived from quarterly price indices. Base salary and social security benefits are CPI-linked. The bonus is taken as mainly influenced by the employing firm's financial performance. We assumed the employer tracks its industry and modeled the bonus relative to its industry factor. Future cash flows (e.g., deferred taxes, Jake's reserve) are modeled as zero coupon bonds. Quarterly covariances are converted to annual based on serially independent returns.