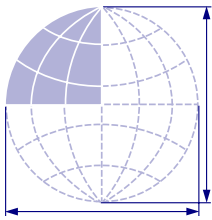10 November 2004

The Investment Clock

Special Report #1: Making Money from Macro

Contributors

Trevor Greetham

Director of Global Asset Allocation,
Institutional Client Group
(44) 20 7996 1535

Michael Hartnett

Deputy Director of the RIC,
Global Private Client Group
(1) 212 449 5827

Highlights of this Issue

The Investment Clock

ML's Investment Clock is an intuitive way of relating asset rotation and sector strategy to the economic cycle. In this report we back-test the theory using more than thirty years of data. We find that, while every cycle has unique aspects, there are clear similarities that can help investors to make money.

Methodology and Results

The Investment Clock model splits the economic cycle into four phases depending on the direction of growth relative to trend and the direction of inflation (Table 1). We use OECD "output gap" estimates and CPI inflation data to identify the historic phases in the U.S. since 1973. Then we calculate the average asset and sector returns for each phase, testing our results for statistical significance. We confirm that Bonds, Stocks, Commodities and Cash outperform in turn as the cycle progresses. We also find a very useful read-across to equity sector strategy and to the shape of the yield curve. ***See the diagram on the next page for a summary of the main results.***

Economic Cycle Analysis is Key

We are not testing a real-time, quantitative trading rule. Rather, we are showing that a correct macro view ought to pay off in a particular way. It is striking how consistent the results are given that we pay no explicit attention to valuation, a factor often held to be of utmost importance. Economic cycle analysis, including an assessment of the aims and effectiveness of policy-makers, will form the core of our tactical asset allocation work.

Based on this methodology, we still favour global "Overheat" plays: commodities, industrial stocks, Asian currencies, Japan and the emerging markets. We would underweight Government bonds, financials, consumer discretionary stocks and the U.S. dollar. ***See pages 17-20 for details.***

Table 1: The Four Phases of the Investment Clock

Phase		Growth*	Inflation	Best Asset Class	Best Equity Sectors	Yield Curve Slope
I	"Reflation"	↓	↓	Bonds	Defensive Growth	Bull Steepening
II	"Recovery"	↑	↓	Stocks	Cyclical Growth	-
III	"Overheat"	↑	↑	Commodities	Cyclical Value	Bear Flattening
IV	"Stagflation"	↓	↑	Cash	Defensive Value	-

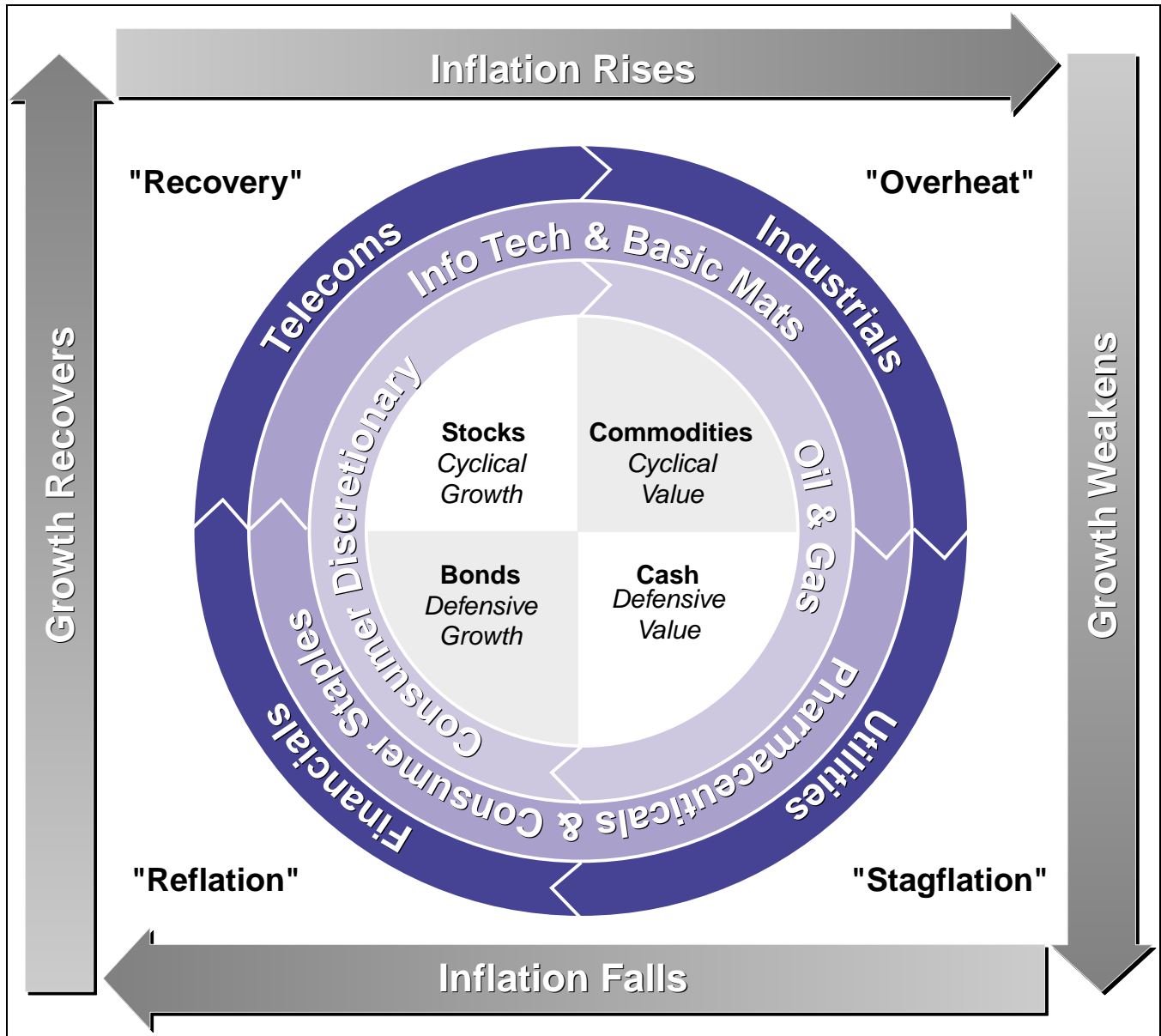Source: ML Global Asset Allocation   * Growth *relative to trend* (i.e. "output gap")

Refer to important disclosures on page 28.

1.   The Investment Clock in a Picture

■ **How to use the Investment Clock**

- ML's Investment Clock splits the economic cycle into four separate phases, depending on the direction of growth relative to trend, i.e. the "output gap", and the direction of inflation. In each phase, the assets and equity sectors shown in the diagram (Chart 1) tend to outperform while those in the opposite corner tend to underperform.

- The classic boom-bust cycle starts at the bottom left and moves around clockwise with Bonds, Stocks, Commodities and Cash outperforming in turn. Life is not always so simple. Sometimes the clock moves backwards or skips a phase. We will be making judgements on the future stage of the global economic cycle in our asset allocation research.

Chart 1: Asset and Sector Rotation over the Economic Cycle

Source: ML Global Asset Allocation Team.

Technical Note: We have tried to arrange things so the closer you are to the middle of the diagram, the stronger the statistical support from our back-testing. The model works best for broad asset rotation and explains some equity sectors (e.g. Consumer Discretionary, Oil & Gas) much more consistently than others (e.g. Telecoms, Utilities).

Refer to important disclosures on page 28.

CONTENTS

Merrill Lynch

2. How The Investment Clock Works

ML's Investment Clock is a way of relating the economic cycle to asset and sector rotation. In the first section of this report, we outline the thinking behind the model.

■ **Long Run Growth and The Economic Cycle**

The long run rate of growth of an economy depends on the availability of the factors of production, labour and capital, and on improvements in productivity. In the short run, economies often deviate from their sustainable growth path and it is the job of policy-makers to get them back onto it. An economy operating below potential will suffer deflationary pressure and ultimately outright deflation. On the other hand, an economy consistently above its sustainable growth path will generate disruptive inflation.

Recognising Turning Points Pays Off

It is very hard to identify changes in the long run trend and even harder to exploit them safely

Financial markets consistently mistake these short-term deviations for changes in the long run trend rate of growth. As a result, assets become mispriced at the extremes of the cycle, just when corrective policy shifts are about to take effect. Investors correctly recognising the turning points can make money by switching into a different asset. Those extrapolating recent history lose out. For example, many investors bought expensive technology stocks in late 1999 on the grounds that the trend growth rate of the U.S. economy was increasing and these companies stood to gain most from this "New Era". However, Fed tightening to counter a modest rise in inflation was already well advanced. The cycle peaked in early 2000 and the dot com bubble burst. The ensuing downturn prompted aggressive Fed ease to the enormous benefit of bonds and residential real estate.

The Four Phases of the Cycle

The Investment Clock framework helps investors to recognise the important turning points in the economy and identifies investments to take best advantage of a change. We split the economic cycle into four phases – Reflation, Recovery, Overheat and Stagflation. Each is uniquely defined by the direction of growth relative to trend, i.e. the "output gap", and the direction of inflation. We believe that each of these phases is linked to the outperformance of a specific asset class: Bonds, Stocks, Commodities and then Cash (Chart 2).

Chart 2: The Theoretical Economic Cycle – Output Gap and Inflation

We divide the economic cycle into four phases, depending on the direction of the output gap and the direction of inflation
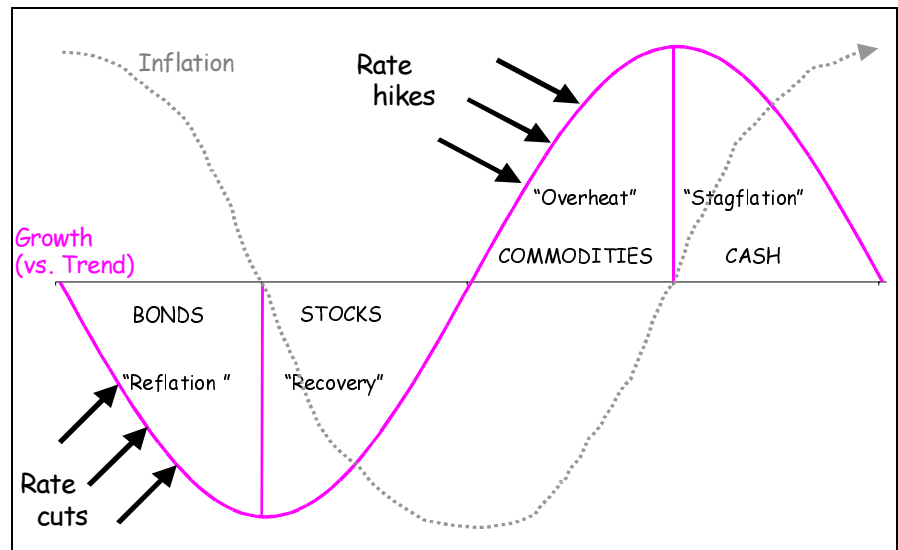
Source: ML Global Asset Allocation Team. The horizontal line represents the "sustainable growth path". Inflation lags growth, starting to rise only once spare capacity has been used up.

Refer to important disclosures on page 28.

Each phase of the economic cycle is associated with a specific asset class

I.   In **Reflation**, GDP growth is sluggish. Excess capacity and falling commodity prices drive inflation lower. Profits are weak and real yields drop. Yield curves shift downwards and steepen as central banks cut short rates in an attempt to get the economy back onto its sustainable growth path. *Bonds are the best asset class.*

II. In **Recovery**, policy ease takes effect and GDP growth accelerates to an above trend rate. However, inflation continues to fall because spare capacity has not yet been used up and cyclical productivity growth is strong. Profits recover sharply but central banks keep policy loose and bond yields stay low. This is the "sweet spot" of the cycle for equity investors. *Stocks are the best asset class.*

III. In **Overheat**, productivity growth slows, capacity constraints come to the fore and inflation rises. Central banks hike rates to bring the economy back down to its sustainable growth path, but GDP growth remains stubbornly above trend. Bonds do badly as yield curves shift upwards and flatten. Stock returns depend on a trade-off between strong profits growth and the valuation de-rating that often accompanies a sell-off in bonds. *Commodities are the best asset class.*

IV. In **Stagflation**, GDP growth slows below trend but inflation keeps rising, often due in part to oil shocks. Productivity slumps and a wage-price spiral develops as companies raise prices to protect their margins. Only a sharp rise in unemployment can break the vicious circle. Central banks are reluctant to ease until inflation peaks, limiting the scope for bonds to rally. Stocks do very badly as profits implode. *Cash is the best asset class.*

■ **The Investment Clock**

The Investment Clock diagram is the same economic cycle re-drawn as a circle (Chart 3). A classic boom-bust cycle would start at the bottom left and move around clockwise. Transitions from one phase to the next are marked by the peaks and troughs in the output gap and inflation cycles.

Chart 3: The Investment Clock

The Investment Clock diagram is the same economic cycle, re-drawn as a circle
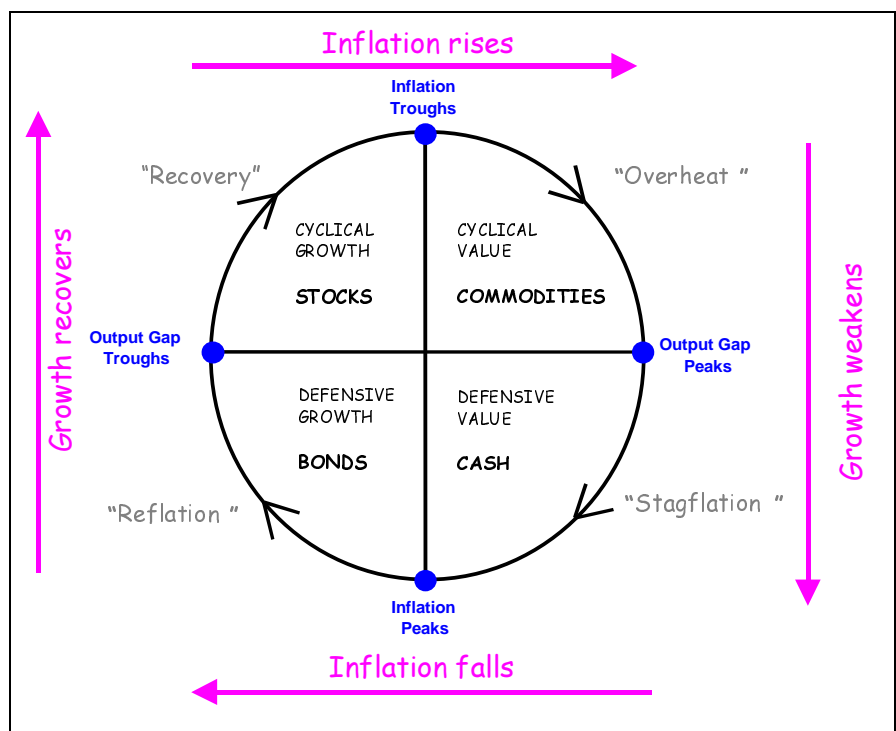
Source: ML Global Asset Allocation Team. Arrows denote the sequence of phases in a classic boom-bust cycle.

Growth and inflation drive the Clock

We can think about growth and inflation separately

One advantage of drawing the cycle like this is that we can think about growth and inflation separately. Growth becomes North-South and inflation East-West. This helps us to understand market moves when overseas influences or shocks like "9/11" mean the cycle does not progress clockwise according to plan.

The Clock helps with Equity Sector Strategy

A second advantage is that it helps us think about sector strategy:

- **Cyclicality:** When growth is accelerating (*North*), Stocks and Commodities do well. Cyclical sectors like Tech or Steel out-perform. When growth is slowing (*South*), Bonds, Cash and defensives outperform.

- **Duration:** When inflation is falling (*West*), discount rates drop and financial assets do well. Investors pay up for long duration Growth stocks. When inflation is rising (*East*), real assets like Commodities and Cash do best. Pricing power is plentiful and short-duration Value stocks outperform.

- **Interest Rate-Sensitives:** Banks and Consumer Discretionary stocks are interest-rate sensitive "early cycle" performers, doing best in Reflation and Recovery when central banks are easing and growth is starting to recover.

- **Asset Plays:** Some sectors are linked to the performance of an underlying asset. Insurance stocks and Investment Banks are often bond or equity price-sensitive, doing well in the Reflation or Recovery phases. Mining stocks are metal price-sensitive, doing well during an Overheat. Oil & Gas is sensitive to the oil price, outperforming in bouts of Stagflation.

The Opposites Make Sense

The clock opposites can generate useful pair trade ideas

Lastly, the opposites are meaningful and can generate useful pair trade ideas. For example, if we are in the Overheat phase we should be long Commodities and Industrial stocks. The consistent short positions would be Reflation plays in the opposite corner: Bonds and Financials.

■ In Summary

ML's Investment Clock links the four phases of the economic cycle to asset and sector rotation and to shifts in the bond yield curve (Table 2). The model makes the evolution of the growth and inflation cycles the key drivers of investment strategy. The rest of this report will test to see how well this theory has worked in practice.

The growth and inflation cycles are the key drivers of asset and sector strategy in the Investment Clock model

Table 2: The Four Phases of the Investment Clock

Phase		Growth*	Inflation	Best Asset Class	Best Equity Sectors	Yield Curve Slope
I	"Reflation"	↓	↓	Bonds	Defensive Growth	Bull Steepening
II	"Recovery"	↑	↓	Stocks	Cyclical Growth	-
III	"Overheat"	↑	↑	Commodities	Cyclical Value	Bear Flattening
IV	"Stagflation"	↓	↑	Cash	Defensive Value	-

Source: ML Global Asset Allocation   * Growth *relative to trend* (i.e. "output gap")

3. Back-Testing Methodology

We base our back-test of the Investment Clock on the U.S., where there are more than thirty years of good data for asset and sector returns. We first associate each calendar month with a phase of the Clock by looking at the interaction between the growth and inflation cycles. Then we group together all the months in a given phase and calculate the average returns from various investments, testing our results for statistical significance.

■ **Peaks and Troughs in the Output Gap Cycle**

The output gap measures the percentage deviation of an economy from its sustainable growth path. We identify the major turning points in the U.S. output gap cycle using the quarterly estimates from the OECD. Since our back-test uses monthly data, we use the ISM manufacturing confidence survey to pinpoint exactly which of the three months of a quarter saw the change in momentum. There have been four clear up-cycles since 1970 and the March 2003 low appears to have marked the start of a fifth (Chart 4).

There have been four clear up-cycles in the U.S. output gap since 1970 and March 2003 appears to have marked the start of a fifth

Chart 4: U.S. Output Gap Estimate showing Major Peaks and Troughs
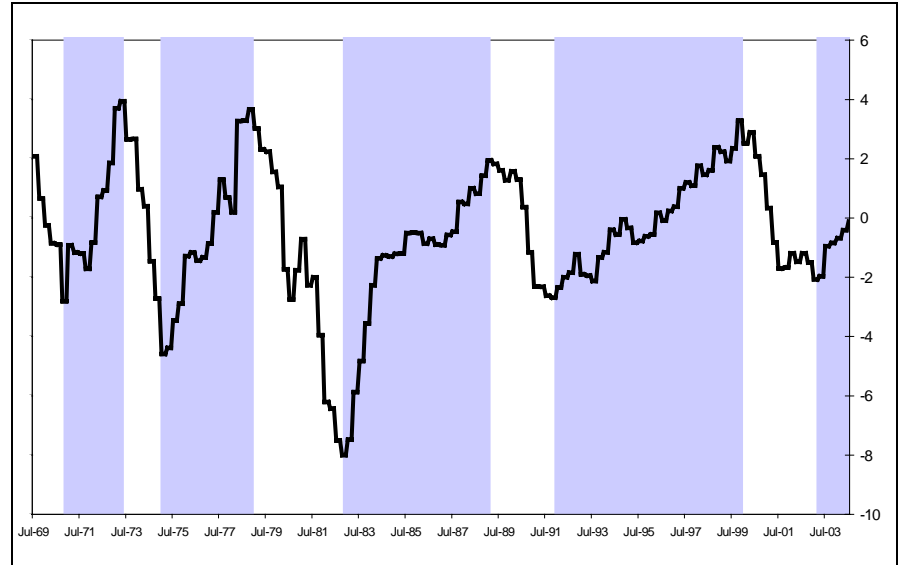
Source: OECD. Shaded areas denote up-cycles in the output gap.

We have absorbed "mini-cycles" like the double-dip recession of 1981/2 into these longer-term trends. Some significant international events like the Asia Crisis or Russia's 1998 devaluation don't show up. The U.S. economy shrugged them off.

■ **Peaks and Troughs in the Inflation Cycle**

We use a similar approach to identify turning points in the U.S. inflation cycle. We focus on the year-on-year rate of headline consumer price inflation as this is the measure targeted, to varying degrees, by the Fed and other central banks – and the Investment Clock model is designed to anticipate their policy changes. The two oil shocks of the 1970s are very clear (Chart 5), as is the overheat in the late 1980s. However, the inflation rate simply tracked sideways in the mid-1990s and the cycles have been muted in recent years. This reflects the fact that core inflation has been fairly stable, but the oil price has not.

Chart 5: U.S. Annual Rate of Headline CPI showing Major Peaks and Troughs
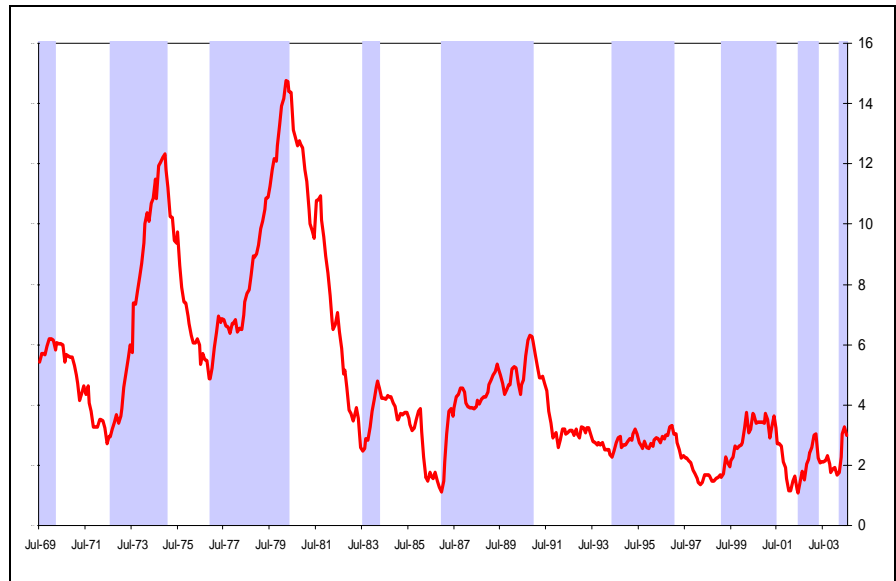
Source: U.S. Bureau of Labor Statistics. Shaded areas denote up-cycles in inflation.

The oil shocks of the 1970s are very clear, as is the late 1980s overheat

■ Defining the Four Clock Phases

Having defined the growth and inflation cycles, we allocate each calendar month to a particular phase of the Investment Clock as the model dictates

Having defined the growth and inflation cycles, we allocate each calendar month to a particular phase of the Investment Clock as the model dictates. For example, the first phase in our back-test period is April 1973 to December 1974. The output gap was falling but inflation was rising, making this "Stagflation". The Clock most often moves forwards in the correct sequence (Chart 6). The back-steps in the mid 1980s and mid 1990s are both associated with external disinflation shocks, the first a collapse in the oil price when OPEC agreements broke down, the second the Asia Crisis. In retrospect, these events were great for the U.S., keeping inflation in check without the need for a domestic economic downturn. The apparently out-of-sequence Stagflation phase in late 2002, early 2003 reflects an external inflation shock, the run up in oil prices before the Iraq War.

Characteristics of the Back-test Period

We are looking at a fairly balanced period overall. The 375 months between April 1973 and July 2004 split reasonably evenly between the four phases (Table 3). Inflation is rising half the time and falling half the time. Periods of sub-par growth are more short-lived than upturns, a consequence of the short, sharp recessions that mark the end of a typical expansion. Each historic phase lasts an average twenty months, making for a roughly six year economic cycle.

Each of the four phases has lasted an average twenty months, making a roughly six year economic cycle

Table 3: U.S. Economic Cycle Frequency and Duration

Phase		Total (months)	Total (years)	Frequency (%)	Average Duration (months)
I	"Reflation"	58	4.8	15%	19.0
II	"Recovery"	131	10.9	35%	21.8
III	"Overheat"	100	8.3	27%	20.0
IV	"Stagflation"	86	7.2	23%	17.2
		375	31.3	100%	19.5

Note: We start our back-test in April 1973, the peak of the first output gap cycle in our data set. We end in July 2004.

■ The Next Stage

The next stage is to group together all the months in a given phase to calculate the average returns from various assets and sectors.

Refer to important disclosures on page 28.

Chart 6: The Four Phases of the U.S. Investment Clock since 1970
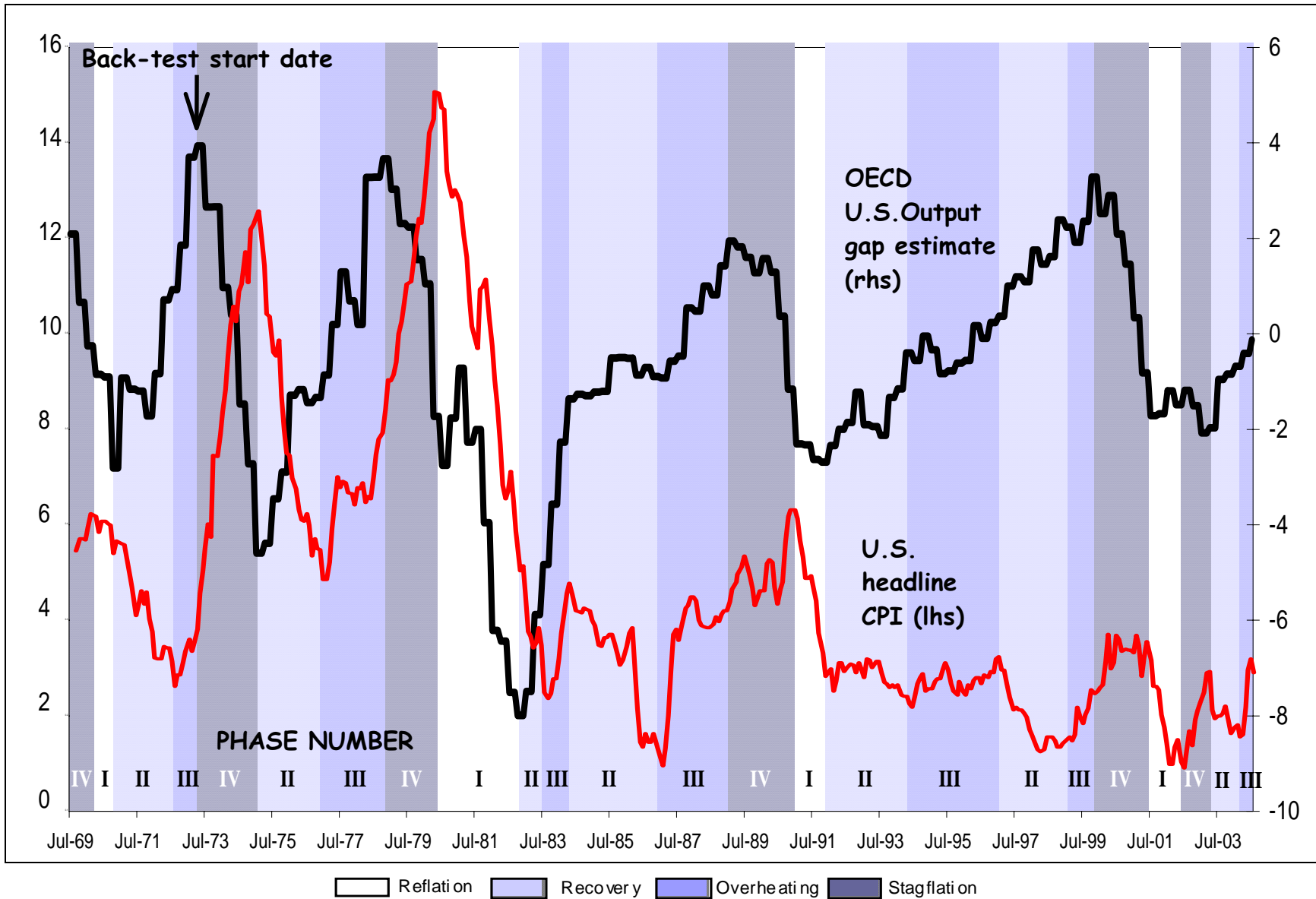
Back-test start date

OECD
U.S.Output
gap estimate
(rhs)

U.S.
headline
CPI (lhs)

PHASE NUMBER

IV I II III IV II III IV I II III II III IV I II III II III IV I IV II III

Jul-69 Jul-71 Jul-73 Jul-75 Jul-77 Jul-79 Jul-81 Jul-83 Jul-85 Jul-87 Jul-89 Jul-91 Jul-93 Jul-95 Jul-97 Jul-99 Jul-01 Jul-03

Reflation   Recovery   Overheating   Stagflation

Source: ML Global Asset Allocation

Merrill Lynch

4. Market Returns over the Cycle

In this section we present the results of our analysis of market returns in each historic phase of the Investment Clock.

Asset Returns

■ What we are Testing

First, we calculate the average returns from the main U.S. dollar asset classes, grouping together the months in each Investment Clock phase. We need to use real inflation-adjusted returns so we can combine months from the high-inflation 1970s with those from periods of low inflation. We include income.

■ Key Results

The average real returns for each phase (Table 4) confirm our intuition. The patterns are also very consistent looking at each phase in turn (Table 5).

I. **Reflation:** Bonds are the best asset class, as expected, returning an average 9.8% real per annum against a long run average of 3.5%. The "Clock opposites", Commodities, are the worst performers.

II. **Recovery:** Stocks are by far the best asset class, returning 19.9% real against a long run average 6.1%. Cash returns are poor. Commodity returns are negative, but this is mostly due to a falling oil price.

III. **Overheat:** Commodities are the best asset class, returning 19.7% against a long run average 5.8%. Bonds are the worst performers, as expected.

IV. **Stagflation:** Cash is the best of a bad bunch, returning -0.3% per annum in real terms. The Clock opposites, Stocks, are the worst performers, as expected. Commodities rise by 28.6%, reflecting the oil shocks of the 1970's, but the picture is mixed with non-oil commodity prices falling.

Chart 7: Asset Rotation
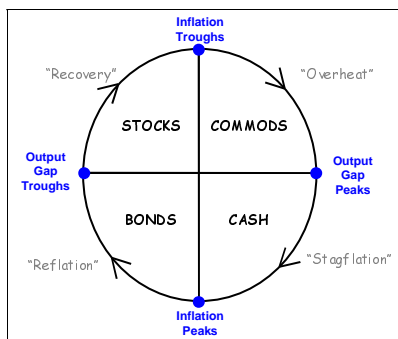
Source: ML Asset Allocation

The average returns for each phase confirm our intuition

Table 4: U.S. Assets – Real Total Returns

Phase		Bonds	Stocks	Commodities	Cash
I:	"Reflation"	**9.8**	6.4	-11.9	3.3
II:	"Recovery"	7.0	**19.9**	-7.9	2.1
III:	"Overheat"	0.2	6.0	**19.7**	1.2
IV:	"Stagflation"	-1.9	-11.7	28.6	**-0.3**
		3.5	6.1	5.8	1.5

Source: Data from April 1973 to July 2004. ML U.S. Treasury/Agencies Master index for bonds, S&P 500 Composite for stocks, GSCI Total Return for commodities and 3-Month T-Bills for cash. Returns at geometric average annual rates.

■ Statistical tests

The statistical results are exceptionally strong

The Investment Clock phases say something very significant about all four asset classes. Analysis of Variance (ANOVA) tests show that we can be 99.9% sure that the variation of returns between the phases is not just the result of sampling from a single overall population. Furthermore, the observed outperformance patterns of Clock opposites are all at least 95% significant using one-sided paired t-tests. For example, if history is any guide to the future we can expect Stocks to beat Cash in a Recovery phase with more than 99.9% confidence. These are exceptionally strong results. *See Appendix for full details.*

■ Conclusion

The back-testing confirms our intuition about asset rotation with a high degree of statistical confidence. It is striking how consistent the results are given that we pay no explicit attention to valuation, a factor often held to be of utmost importance. Top-down economic cycle analysis should be the starting point for tactical asset allocation between the main asset classes.

Refer to important disclosures on page 28.

■ **Full History**

This table shows the inflation-adjusted total returns for each Investment Clock phase since April 1973, all figures shown at annualised rates.

Table 5: Full Details of U.S. Real Asset Returns in Each Phase

Bonds significantly outperformed Commodities in every Reflation phase

REFLATION		*Months*	Bonds	Stocks	Commodities	Cash
Dec-74	to Jan-75	*1*	**45**	142	-78	0
Apr-80	to Nov-82	*31*	**9**	10	-6	5
Nov-90	to Dec-91	*13*	**11**	20	-9	3
May-01	to Jun-02	*13*	**8**	-18	-18	1
Average		*58*	**9.8**	6.4	-11.9	3.3

Stocks outperformed Cash in every Recovery phase with returns in excess of 20%, apart from the early 1990s (when Germany and Japan were in recession)

RECOVERY		*Months*	Bonds	Stocks	Commodities	Cash
Jan-75	to Dec-76	*23*	4	**20**	-17	-1
Nov-82	to Jul-83	*8*	7	**34**	10	5
Mar-84	to Dec-86	*33*	15	**20**	0	5
Dec-91	to May-94	*29*	3	**6**	-4	0
Dec-96	to Feb-99	*26*	6	**27**	-27	3
Mar-03	to Mar-04	*12*	2	**33**	16	-1
Average		*131*	7.0	**19.9**	-7.9	2.1

Commodities beat bonds in every Overheat phase, with both oil and industrial commodity prices strong

OVERHEAT		*Months*	Bonds	Stocks	Commodities	Cash
Dec-76	to Nov-78	*23*	-5	-9	**14**	-2
Jul-83	to Mar-84	*8*	3	-6	**12**	5
Dec-86	to Jan-89	*25*	0	6	**20**	2
May-94	to Dec-96	*31*	5	21	**16**	2
Feb-99	to Nov-99	*9*	-2	16	**56**	2
Mar-04	to Jul-04	*4*	-10	-1	**20**	-4
Average		*100*	0.2	6.0	**19.7**	1.2

Cash beat Stocks in most Stagflation phases; Bonds were badly hurt in the 1970s oil shocks

STAGFLATION		*Months*	Bonds	Stocks	Commodities	Cash
Apr-73	to Dec-74	*20*	-8	-31	50	**-3**
Nov-78	to Apr-80	*17*	-13	0	4	**-2**
Jan-89	to Nov-90	*22*	5	4	31	**2**
Nov-99	to May-01	*18*	4	-9	23	**2**
Jun-02	to Mar-03	*9*	7	-23	44	**-1**
Average		*86*	-1.9	-11.7	28.6	**-0.3**

OVERALL		*Months*	Bonds	Stocks	Commodities	Cash
Apr-73	to Jul-04	*375*	3.5	6.1	5.8	1.5

Note: Data from April 1973 to July 2004. Returns at geometric average annual rates. Figures in bold denote the asset class that the Investment Clock theory says should perform best.

Historical Footnote

Relative asset returns over the whole back-test period make sense:

- Stocks did best overall, returning 6.1% real p.a. and beating bonds by an "equity risk premium" of about 2.5%.

- Bonds beat cash by 2%, reflecting compensation for duration risk and a little credit risk (the ML Master Index includes Agencies).

- Surprisingly strong commodity returns reflect the rise in crude oil from $2.74 a barrel in April 1973 to $40 in July 2004.

- The real cash return of 1.5% p.a. is the average real interest rate. This looks low versus trend growth of 2.9% over the period, but Fed policy was way too loose in the 1970s – as evidenced by the surge in CPI to 15% in 1980.
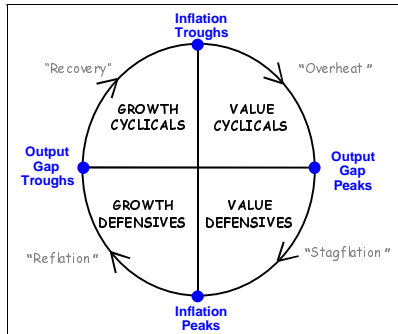
Merrill Lynch

Chart 8: Equity Sector Rotation

Source: ML Asset Allocation

These results are presented with Reflation at the bottom left, like the Investment Clock diagram

Note the timing difference between "early cycle" Consumer Discretionary stocks and "late cycle" Industrials

We got similar results when looking at Global Sectors

Equity Sectors

■ What we are testing

We use the same approach for U.S. equity sectors, calculating performance relative to the overall market in each of the historic Investment Clock phases.

■ Key Results

Patterns of sector out- and under-performance across the cycle (Table 6) allow us to identify the following pair trades, each reflecting diametrically opposed macro views. *These pairs are summarised in the Investment Clock diagram on page 2.*

1. **Consumer Discretionary vs. Energy:** Consumer Discretionary stocks like Retailers do well when inflation and interest rates are falling (*West*). Oil & Gas does well when inflation and the oil price are rising (*East*).

2. **Cyclicals vs. Industrials:** Financials do well when central banks are reflating the economy (*South-West*). General Industrials do well when central banks are hiking rates (*North-East*).

3. **Telecoms vs. Utilities:** In recent years, Telecom stocks behave like Growth Cyclicals, doing well during a disinflationary recovery (*North-West*). Utilities are Value Defensives, doing relatively well during stagflation (*South-East*).

Table 6: U.S. Broad Sector Returns Relative to the Market

RECOVERY		OVERHEAT	
Consumer Discretionary	3.8	Technology	4.7
Telecoms	3.7	Industrials	4.3
Technology	3.3	Oil & Gas	4.2
Financials	1.4	Pharmaceuticals	2.9
Industrials	-0.4	Consumer Staples	1.1
Basic Materials	-2.4	Telecoms	-0.9
Consumer Staples	-3.1	Financials	-1.8
Utilities	-3.1	Utilities	-3.2
Oil & Gas	-4.4	Basic Materials	-3.6
Pharmaceuticals	-4.5	Consumer Discretionary	-5.8

REFLATION		STAGFLATION	
Consumer Staples	13.3	Oil & Gas	14.7
Financials	11.0	Pharmaceuticals	11.6
Consumer Discretionary	8.9	Utilities	6.4
Pharmaceuticals	5.6	Consumer Staples	2.5
Basic Materials	0.5	Industrials	2.1
Industrials	-4.5	Basic Materials	2.1
Technology	-4.6	Financials	1.6
Utilities	-4.7	Telecoms	0.0
Telecoms	-10.2	Consumer Discretionary	-8.9
Oil & Gas	-12.8	Technology	-12.5

Source: Datastream indices for ten sectors covering 92% of the market. Returns at geometric average annual rates.

■ Statistical tests

ANOVA tests confirm that the Investment Clock phases say something significant about five of the ten broad equity sectors. Consumer Discretionary and Oil & Gas stand out as the most macro-driven sectors. Telecoms, Utilities and, surprisingly, Basic Materials are poorly explained by the model. One-sided t-tests identify forty 95% significant pair trades across the four phases. *See Appendix for full details.*

Refer to important disclosures on page 28.

■ **Detailed Industry Breakdown**

The following table shows the most important results at the industry level.

Table 7: U.S. Industry Returns Relative to the Market

RECOVERY		OVERHEAT	
Top 10		*Top 10*	
Leisure & Hotels	7.4	Electrical Equipment	4.8
Auto & Parts	7.2	IT Hardware	4.5
Software & Computer Services	5.1	Steel & Other Metals	4.2
Retail, General	3.9	Oil & Gas	4.2
Real Estate	3.8	Engineering & Machinery	4.1
Telecoms	3.7	Beverages	3.7
Speciality & Other Finance	3.5	Software & Computer Services	3.7
Food & Drugs Retailers	2.8	Gas Distribution	3.2
IT Hardware	2.8	Pharmaceuticals & Biotech	2.9
Aerospace, Defence	2.6	Diversified Industries	2.8
Bottom 10		*Bottom 10*	
Gas Distribution	-3.7	Media & Entertainment	-4.5
Diversified Industries	-4.2	Auto & Parts	-5.2
Forestry & Paper	-4.2	Forestry & Paper	-5.2
Oil & Gas	-4.4	Speciality & Other Finance	-5.3
Pharmaceuticals & Biotech	-4.5	Real Estate	-5.6
Steel & Other Metals	-5.5	Construction, Building Materials	-5.9
Tobacco	-6.9	Household Goods & Textiles	-7.5
Health	-7.1	Mining	-8.9
Investment Companies	-8.6	Retail, General	-10.1
Mining	-16.0	Investment Companies	-13.6

REFLATION		STAGFLATION	
Top 10		*Top 10*	
Retail, General	24.8	Tobacco	20.6
Real Estate	20.1	Gas Distribution	18.8
Household Goods & Textiles	20.1	Oil & Gas	14.7
Speciality & Other Finance	17.1	Mining	12.4
Beverages	17.0	Pharmaceutical & Biotech	11.6
Tobacco	14.6	Aerospace, Defence	9.7
Banks	14.2	Food Producers & Processors	9.6
Health	13.9	Health	8.2
Food Producers & Processors	13.6	Insurance	7.0
Support Services	13.2	Life Assurance	5.4
Bottom 10		*Bottom 10*	
Engineering & Machinery	-3.5	Household Goods & Textiles	-5.6
Construction, Building Materials	-3.6	Software & Computer Services	-6.2
Aerospace, Defence	-4.0	Retail, General	-7.6
Diversified Industries	-6.1	Media & Entertainment	-9.3
Auto & Parts	-6.5	Leisure & Hotels	-10.0
IT Hardware	-8.0	Support Services	-10.0
Steel & Other Metals	-9.5	Investment Companies	-11.5
Telecoms	-10.2	Real Estate	-11.8
Oil & Gas	-12.8	Auto & Parts	-12.2
Gas Distribution	-26.8	IT Hardware	-14.0

Source: Data from April 1973 to July 2004. Top and bottom ten performers from the 35 industries at Datastream Level 4.

General Retailers show strong early cycle characteristics – top in Reflation, second to bottom in Overheat

Steel is the mirror image

Telecom stocks behave like Growth Cyclicals, doing well in the Recovery phase

Tobacco is the ultimate Defensive Value, even beating Energy in Stagflation phases

■ **Conclusion**

The Investment Clock provides a very useful read-across to sector strategy

The Investment Clock provides a very useful read-across to sector strategy. The model explains some sectors (e.g. Consumer Discretionary, Oil & Gas) much more consistently than others (e.g. Telecoms, Utilities, Basic Materials).

Fixed Income

■ What we are Testing

We analyse changes in nominal interest rates at various points on the U.S. government yield curve. Theory suggests a particular sequence of steepening and flattening shifts as the cycle progresses (Chart 9).

■ Key Results

The front end of the curve behaves as the theory suggests:

- The Fed cuts rates most aggressively during Reflation – by an average 324 basis points p.a. – and continues to ease during disinflationary Recovery.

- The Fed hikes most rapidly during Overheat and, on average, hikes further into Stagflation. This reflects the oil shocks of the 1970s. Under Greenspan, the Fed looked through the milder Stagflation periods and eased rates slightly.

The back end also behaves as the theory suggests:

- Ten-year Treasury bonds rally during the disinflationary Reflation and Recovery phases but sell off in the other two phases as inflation rises.

Chart 9: Bond Yield Curve Shifts
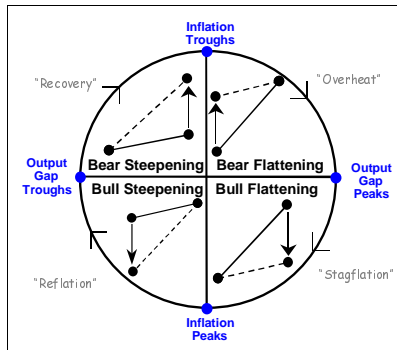
Source: ML Global Strategy

We see Bull Steepening in Reflation, Bear Flattening in Overheat

Table 8: Changes in Nominal Interest Rates

		Fed Funds	3 Month T-Bills Yield	2Yr Bond Yield	10Yr+ Bond Yield	Yield Curve Slope*	Yield Curve Level	Aggregate Curve Shift
I:	"Reflation"	-324	-225	-141	-43	+182	-268	Bull / Steepening
II:	"Recovery"	-60	-56	-44	-45	+12	-101	Bull / Steepening
III:	"Overheat"	+122	+102	+107	+54	-48	+147	Bear / Flattening
IV:	"Stagflation"	+86	+51	-13	+20	-32	+93	Bear / Flattening

Note: Data from April 1973 to July 2004. Figures show actual basis point change in nominal interest rates, annualised.
* Yield Curve Slope defined here as Ten year bond yield minus 3 month T-Bill rate.

Putting these together, we get the characteristic yield curve shifts in the two phases in which the Fed is in play:

- In Reflation we see "Bull Steepening". We could argue that the Fed keeps hiking rates until the yield curve steepens – a sign of imminent Recovery.

- Likewise, we see "Bear Flattening" in the Overheat phase. Again, we could say the Fed keeps hiking rates *until* the yield curve flattens.

■ Statistical tests

The yield curve level is strongly associated with the economic cycle; the slope less so. Only Bull Steepening in Reflation survives the t-test with 95% confidence. ***See Appendix for full details.***

■ Other Fixed Income

We do not have data for other classes of fixed income back to 1973. Investigations over a shorter time period suggest that emerging market sovereign debt and high yield corporates behave like cyclical equity sectors, outperforming Treasuries in the Recovery and Overheat phases when growth is above trend. Inflation-protected bonds outperform conventional bonds during Overheat and Stagflation.

■ Conclusion

The Investment Clock helps us to decide a fixed income strategy

The Investment Clock helps us to decide a fixed income strategy. The level of the yield curve reflects inflation pressures. The slope is most predictable when the Fed is in play. The model can be extended to include other classes within fixed income, including emerging market debt and TIPs.

Foreign Exchange

■ What we are testing

We look at the movement in bilateral exchange rates in each historic phase of the U.S. Investment Clock.

■ Key Results

There is one clear and, at first, counter-intuitive pattern:

- The U.S. dollar has been strongest during the Reflation and Recovery phases of its cycle, periods of falling U.S. inflation and a falling Fed Funds rate. Interest rates overseas may well be falling faster and international investors often see the dollar as a safe haven in times of stress.

- We see significant strength in the Japanese yen and the Australian dollar during U.S. Overheat phases. Again, it is interesting that the U.S. dollar is weak in the phase of the cycle that sees the most aggressive Fed rate hikes.

We see significant strength in the Japanese yen and Aussie dollar in the U.S. Overheat phase

Table 9: Bilateral Exchange Rates (annualised change)

RECOVERY			OVERHEAT		
		Strong			Strong
USD per JPY	+6.7	*JPY*	USD per JPY	+9.9	*JPY*
USD per EUR	-1.6	*USD*	USD per AUD	+7.0	*AUD*
USD per CAD	-2.7	*USD*	USD per GBP	+5.8	*GBP*
USD per GBP	-4.6	*USD*	USD per EUR	+1.7	*EUR*
USD per AUD	-7.0	*USD*	USD per CAD	0.0	-
USD per ZAR	-10.5	*USD*	USD per ZAR	-3.7	*USD*
EUR per JPY	+8.5	*JPY*	CHF per AUD	+0.4	*AUD*
CHF per AUD	-9.4	*CHF*	EUR per JPY	+8.1	*JPY*

REFLATION			STAGFLATION		
		Strong			Strong
USD per CAD	-0.8	*USD*	USD per EUR	+2.0	*EUR*
USD per JPY	-1.3	*USD*	USD per GBP	+1.2	*GBP*
USD per AUD	-1.4	*USD*	USD per CAD	+0.3	*CAD*
USD per GBP	-6.3	*USD*	USD per ZAR	0.0	-
USD per EUR	-8.9	*USD*	USD per AUD	-5.7	*USD*
USD per ZAR	-13.7	*USD*	USD per JPY	-7.4	*USD*
EUR per JPY	+8.3	*JPY*	EUR per JPY	-9.3	*EUR*
CHF per AUD	+3.3	*AUD*	CHF per AUD	-10.4	*CHF*

Source: Datastream. Data from April 1973 to July 2004.

The U.S. dollar has been strongest during Reflation and Recovery, when Fed Funds is falling

■ Statistical tests

Statistical tests indicate that most exchange rate pairs are not strongly associated with the U.S. economic cycle. Notable exceptions are the yen/U.S. dollar and Australian dollar/U.S. dollar crosses. ***See Appendix for full details.***

■ Conclusion

Foreign exchange depends on the difference between two economies

Foreign exchange depends on the difference between two economies so we ought not expect strong results when classifying returns using the U.S. cycle alone. None-the-less, we can say that Asian currencies tend to do well during a U.S. Overheat – and the U.S. dollar is often strongest during Reflation, in spite of aggressive Fed rate cuts.

Equity Country Strategy

■ What we are Testing

Lastly, we look at the performance of a range of international equity markets relative to the world index. We assume no currency hedging.

■ Key Results

Broadly speaking we can allocate countries into each phase as follows:

I.   **Reflation:** Singapore, UK, U.S. – defensive, interest rate sensitives.

II.   **Recovery:** Hong Kong, Switzerland, Eurozone – a mixed bag.

III.   **Overheat:** Japan – trades like a Steel stock.

IV.   **Stagflation:** South Africa, Canada, Australia – the "resource markets".

The Investment Clock theory says nothing about country strategy, but some reasonable patterns emerge

Table 10: Country Returns Relative to World Index, in U$ (annualised, %)

RECOVERY		OVERHEAT	
Hong Kong	9.3	Japan	10.5
Switzerland	4.4	UK	6.9
Eurozone	4.1	Australia	2.5
U.S.	-0.4	Hong Kong	2.0
Japan	-1.7	Singapore	1.1
UK	-1.8	South Africa	0.5
Australia	-6.7	Switzerland	-0.2
Canada	-8.4	Eurozone	-1.8
Singapore	-9.4	Canada	-2.1
South Africa	-11.0	U.S.	-4.9

REFLATION		STAGFLATION	
Singapore	18.5	South Africa	25.9
U.S.	4.7	Canada	13.8
UK	4.1	Australia	9.3
Canada	-0.8	Eurozone	7.0
Australia	-1.5	U.S.	5.7
South Africa	-2.4	Switzerland	5.1
Hong Kong	-2.9	UK	0.4
Switzerland	-7.4	Singapore	-7.1
Japan	-7.7	Japan	-8.6
Eurozone	-11.3	Hong Kong	-8.8

Source: Datastream global equity indices, total return in U.S. dollar terms. Data from April 1973 to July 2004.

■ Statistical Tests

ANOVA confidence levels are similar in magnitude to those for U.S. sectors – a positive surprise

The ANOVA confidence levels for unhedged country returns versus the world index are similar in magnitude to those for U.S. sectors – a positive surprise. One-sided t-tests help us to allocate each country to a particular phase. However, we caution against reading too much into results with a poor statistical backing. The UK appears to do well in the Overheat, for example, but is poorly explained by the model judging by its low ANOVA statistic. *See Appendix for full details.*

■ Conclusion

The U.S. Investment Clock helps with global equity strategy, with particular countries tending to outperform in each phase. That said, it would make sense to consider the Investment Clock fundamentals within a particular overseas market before making an investment decision either way.

5. Using the Investment Clock in Practice

■ What this Report Shows

We are not testing a real-time, quantitative trading rule. Rather, we are showing that a correct macro view ought to pay off in a particular way. This report is a powerful justification for "buy-side" economics teams and macro strategies. Economic cycle analysis, including an assessment of the aims and effectiveness of policy-makers, will form the core of our tactical asset allocation work.

■ Applying the Model in Practice

We will develop our methodology further in future Special Reports. Here, we outline the basic approach we intend to take in setting our global balanced fund strategy and we make some initial conclusions. We will start by attempting to answer three questions for each major economy:

1. Where are we in the cycle? "Overheat in the U.S."

*The U.S. is in the Overheat phase currently – the FOMC agrees with us because they are hiking rates*

We will identify the current Investment Clock phase by looking at recent economic data. The simplest way is to find a good proxy for real GDP growth. Over the last three months the ISM survey has averaged above 55, the level corresponding to trend GDP growth in the U.S. (Chart 10). This points to either the Recovery or the Overheat phase. We can decide if the output gap is positive or negative by looking at CPI itself. Rising inflation relative to a 12-month moving average (Chart 11) implies an economy operating above its sustainable growth path. We conclude Overheat in the U.S. economy. The FOMC clearly agrees with us, at least for now, because they are hiking rates.

2. What do leading indicators say? "Growth slowing, inflation still rising"

We need to develop a systematic way of predicting the next Investment Clock phase. Economists are generally concerned with forecasting the future *level* of a range of economic indicators. We need decide only on the future *direction* of the output gap and the future *direction* of inflation. We have developed simple Scorecard indicators to help us judge the near term momentum for each major economy (see Tables 12 & 13 on page 20).

Chart 10: U.S. Real GDP Growth, ISM Index and the ML Growth Scorecard Indicator

Over the last three months the ISM survey has averaged above 55, the level that corresponds to trend growth in the U.S.
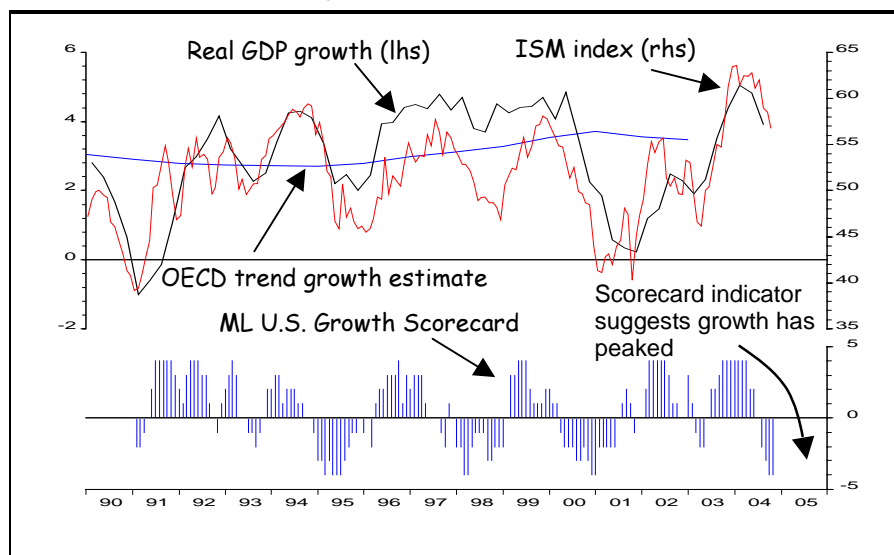
*The Scorecard indicator points to slower growth*

Source: ML Global Asset Allocation team. The ML Growth Scorecard indicator is a diffusion index based on central bank policy, OECD leading indicators, the ISM and consensus real GDP forecasts. Details available on request.

U.S. GDP growth has almost certainly peaked, but may not move consistently below trend for some time

The ML Growth Scorecard is a diffusion index based on central bank policy, OECD leading indicators, business confidence and consensus real GDP forecasts. It is a good six month lead indicator for the direction of GDP growth. The most recent U.S. reading is minus four out of four, as bad as it gets (also on Chart 10). This should be no surprise. Growth has almost certainly peaked. The ISM has come off the boil and we no longer have the easy Iraq war and SARS comparisons of 2003 Q1. However, GDP growth may not move *consistently below trend* for some time. This is an important distinction. Global GDP growth peaked in 1988, but the output gap and inflation didn't peak until 1990. In the meantime, emerging market equities did well and bonds sold off.

Chart 11: U.S. CPI with 12-month Average and the ML Inflation Scorecard Indicator

U.S. CPI has troughed at the headline and the core level
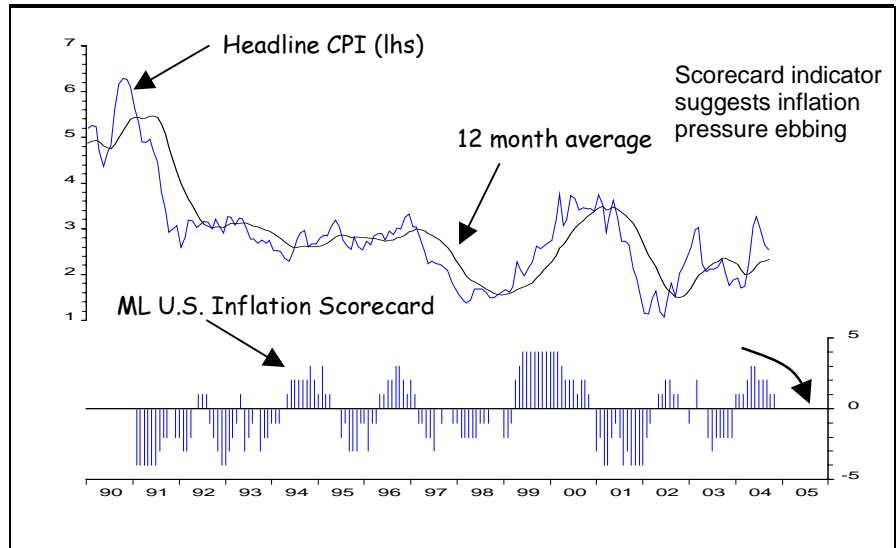
The Scorecard indicator says inflationary pressures are ebbing

Source: ML Global Asset Allocation team. Scorecard details available on request.

The ML Inflation Scorecard indicator is a diffusion index based on OECD output gap estimates, the oil price in local currency, prices paid surveys and consensus CPI forecasts. The most recent U.S. reading is a benign plus one out of four (also on Chart 11). It feels like inflationary pressures are ebbing.

3. What do policy makers want? "Trend." Can they deliver? "Probably."

The Fed would presumably like to see trend or slightly above trend growth in 2005

We frame our medium term view in the context of potential corrective policy action. The Fed would presumably like to see trend or slightly above trend growth in 2005, so inflation stabilises at or above current levels. A continued mild Overheat seems a reasonable base case to adopt. The oil shock poses a downside growth risk, but the Fed would probably act to offset any negative impact. There is every sign that monetary policy is working, judging by the on-going strong rise in real estate prices. A drop in oil prices could take the lid off the U.S. consumer, resulting in an upside growth surprise.

■ Global Considerations: Continued Mild Overheat in 2005

Globally, a continued mild Overheat is likely in 2005

Following a similar line of thought, we are likely to see a continued mild Overheat globally. China is clearly in its Overheat phase but may stay there for most of 2005. Inflation is rising and the authorities would like to slow the economy, but so far their efforts have had little effect. Technically, Japan is also in Overheat but the authorities would like to keep it that way. Inflation is rising but is only just turning positive. Eurozone inflation at 2.5% is above the 2% target but with German business surveys coming in weak, the ECB is likely to stay on the sidelines. Europe will probably not be a swing factor for the world economy. Finally, the Bank of England has been hiking rates and there are signs that house prices may be peaking, but the UK is too small to matter much and with "HICP" inflation below target, rates would come down very quickly if necessary.

■ What Does the Market Think?

Our trades are likely to be more profitable if we disagree with the consensus, assuming we turn out to be right. We can gauge market opinion in several ways.

1. Short Term Sentiment

Returns over 2004 Q3 suggested a mix of Stagflation (oil up, tech down) and Overheat (emerging markets and mining stocks doing well). The Fund Managers in our October survey say they are overweight energy stocks, industrials, Japanese and emerging market equities. They are underweight bonds, consumer discretionary stocks and U.S. equities. Balanced fund managers like stocks as an asset class, but are overweight cash. These views are consistent with Overheat.

2. Medium Term Macro Outlook

We can compare our Medium term macro views directly with the survey. Most Fund Managers think the world economy has a negative rather than positive output gap, i.e. it is operating below its sustainable growth path (Table 11).

41% think the global economy has a negative output gap vs. 29% seeing a positive output gap

Table 11: Do You Think the Global Economy is Operating With...

% saying	Oct	Sep	Aug
A positive output gap (i.e. output above trend growth path)	29	25	29
A negative output gap (i.e. output below trend growth path)	41	42	42
With a zero output gap	25	28	22
Net % See a Positive Output Gap	**-12**	**-17**	**-13**
Don't know	6	5	7

Source: ML Fund Manager Survey, October 2004

Until recently Fund Managers thought growth was going to be strong enough to move the world into Overheat, judging by their concerns about inflation. In recent months these fears have started to evaporate. Most Fund Managers now think global growth has peaked and fewer think inflation will rise (Chart 12).

Chart 12: Expectations for Global Growth and Inflation
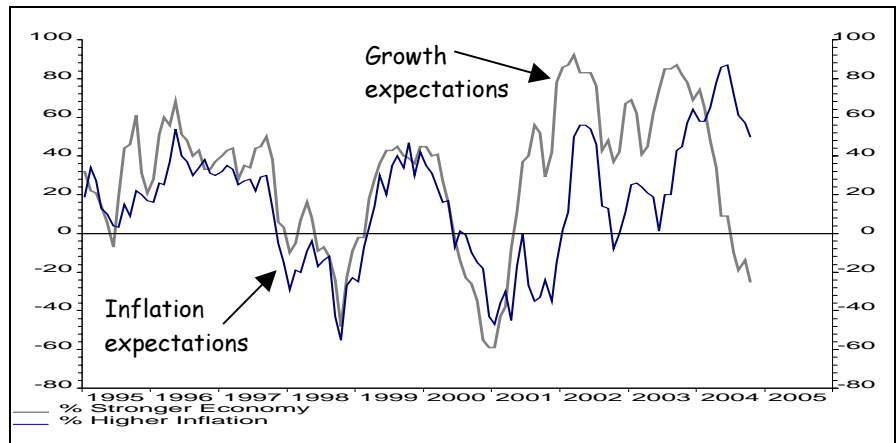
Growth and inflation expectations continue to decline (though the gap between the two remains wide)

Source: ML Fund Manager Survey, October 2004

■ Current View: We Still favour Global Overheat Plays

We continue to favour global "Overheat" plays: commodities, industrial stocks, Asian currencies, Japan and the emerging markets

We find it hard to disagree strongly with the consensus view that growth is slowing. However, we think the global output gap is already slightly positive and we expect it to become more so over 2005. We continue to favour global "Overheat" plays: commodities, industrial stocks, Asian currencies, Japan and the emerging markets. We would underweight Government bonds, financials, consumer discretionary stocks and the U.S. dollar. The next "Reflation" phase still feels some way off.

■ ML Growth and Inflation Scorecards: Global Growth Slowing, But Inflation Pressures Persist

Table 12: Economic Growth Scorecards

		Nov-04	Oct-04	Sep-04	Aug-04	Jul-04	Jun-04
US	Central Bank stance	-	-	-	-	-	=
	Leading Indicators	-	-	=	=	+	+
	Business Confidence	-	-	-	=	=	+
	Consensus GDP Forecast	-	-	-	-	=	=
	Total	**-4**	**-4**	**-3**	**-2**	**0**	**+2**
Eurozone	Central Bank stance	=	=	=	=	=	+
	Leading Indicators	-	=	=	+	+	+
	Business Confidence	-	-	-	=	-	=
	Consensus GDP Forecast	+	+	+	+	+	=
	Total	**-1**	**+0**	**+0**	**+2**	**+1**	**+2**
UK	Central Bank stance	-	-	-	-	-	-
	Leading Indicators	-	-	=	=	+	+
	Business Confidence	-	=	+	+	+	+
	Consensus GDP Forecast	-	=	=	=	+	+
	Total	**-4**	**-2**	**+0**	**+0**	**+2**	**+2**
Japan	Central Bank stance	+	+	+	+	+	+
	Leading Indicators	-	-	-	-	=	=
	Business Confidence	-	=	=	+	=	+
	Consensus GDP Forecast	-	=	=	+	+	+
	Total	**-2**	**+0**	**+0**	**+2**	**+2**	**+3**
Global	**Average**	**-2.75**	**-1.50**	**-0.75**	**+0.50**	**+1.25**	**+2.25**

Note: A positive score for the growth scorecard suggests that economic growth should accelerate over the next two quarters. A negative score suggests a slowdown in growth.
Central Bank stance scores +1 if the last rate move was down, -1 if up; 0 if no change over 12 months; others score +1 if indicator above 6 and 12m moving average; -1 if below both

The Global Growth score sharply negative

Table 13: Inflation Scorecards

		Nov-04	Oct-04	Sep-04	Aug-04	Jul-04	Jun-04
US	OECD Output Gap	=	=	=	=	=	=
	Oil Price	+	+	+	+	+	+
	Prices Survey	=	-	=	=	=	+
	Consensus CPI Forecast	=	+	+	+	+	+
	Total	**+1**	**+1**	**+2**	**+2**	**+2**	**+3**
Eurozone	OECD Output Gap	-	-	-	-	-	-
	Oil Price	+	+	+	+	+	+
	Prices Survey	+	+	+	+	+	+
	Consensus CPI Forecast	+	+	+	+	+	=
	Total	**+2**	**+2**	**+2**	**+2**	**+2**	**+1**
UK	OECD Output Gap	=	=	=	=	=	=
	Oil Price	+	+	+	+	+	+
	Prices Survey	=	+	+	+	+	+
	Consensus CPI Forecast	=	=	-	-	-	-
	Total	**+1**	**+2**	**+1**	**+1**	**+1**	**+1**
Japan	OECD Output Gap	=	=	=	=	=	=
	Oil Price	+	+	+	+	+	+
	Prices Survey	=	=	=	+	+	+
	Consensus CPI Forecast	+	+	+	+	+	+
	Total	**+2**	**+2**	**+2**	**+3**	**+3**	**+3**
Global	**Average**	**+1.50**	**+1.75**	**+1.75**	**+2.00**	**+2.00**	**+2.00**

Note: A positive score for the inflation scorecard indicates that the inflation rate should increase over the next two quarters. A negative score suggests a fall in inflation.
OECD Output Gap scores +1 if growth is 1% or more above trend, -1 if growth is 1% or more below trend; others score +1 if indicator above 6 and 12m moving average; -1 if below both

Mild inflationary pressure still evident

I. Statistical Appendix

We need to check that the historic relationships we observe between the economy and the markets are robust. Average returns can be distorted by outliers, so we also perform statistical tests on the monthly data.

Asset Classes

We start by investigating the statistical properties of the asset class returns in each historic Investment Clock phase. We repeat the results table here for convenience.

Table 14: U.S. Assets – Real Total Returns

Phase		Bonds	Stocks	Commodities	Cash
I:	Reflation	**9.8**	6.4	-11.9	3.3
II:	Recovery	7.0	**19.9**	-7.9	2.1
III:	Overheat	0.2	6.0	**19.7**	1.2
IV:	Stagflation	-1.9	-11.7	28.6	**-0.3**
		3.5	6.1	5.8	1.5

Source: ML U.S. Treasury/Agencies Master index for bonds, S&P 500 Composite index for stocks, GSCI Total Return Index for commodities and the return from 3-Month T-Bills for cash. Returns are geometric average annualised rates.

Analysis of Variance (ANOVA)

The one-way Analysis of Variance test is to see how likely it is that we got the average returns for a given asset class by chance after taking four separate samples from the same overall population. The F-statistic compares the variation in returns over the entire period against the variation observed between each phase.

The Investment Clock phases are highly significant for each of the four asset classes

Table 15: U.S. Real Asset Returns – One-Way ANOVA

	Bonds	Stocks	Commodities	Cash
F-Stat	5.83	5.57	8.31	13.22
Confidence Level	**99.93%**	**99.90%**	**99.99%**	**99.99%**

Note: Figures in Bold denote confidence levels of more than 90%.

The Investment Clock phases say something very significant about asset returns. For all four asset classes, there is a less than 0.1% probability that these results could have resulted purely by chance. This feels right. The mean returns vary substantially from one phase to the next and the sample sizes are large.

T-Tests

The next step is to look at relative returns. We perform one-sided paired t-tests for each possible pair of assets (Table 16). Here are the most significant outperformance relationships in each phase.

We can be 95% confident that the assets that theory says should do best (in bold) beat the theoretical worst performers (in italics)

I. **Reflation: Bonds** > Cash > *Commodities*, also Stocks > *Commodities*

II. **Recovery: Stocks** > Bonds > *Cash* > Commodities

III. **Overheat: Commodities** > Stocks > Cash/*Bonds*

IV. **Stagflation: Commodities** > **Cash**/Bonds > *Stocks*

What matters most, in terms of validating our model, is the pair of assets opposite each other in the Investment Clock diagram. These are the assets that theory says should do best and worst in each phase. The observed outperformance patterns are all at least 95% significant. For example, if history is any guide to the future we can expect with more than 99.9% confidence that Stocks will beat Cash in a Recovery phase. These are exceptionally strong results.

Table 16: U.S. Real Asset Returns – Paired T-Tests

In Reflation, we can be very confident that Bonds beat Commodities and Cash; Commodities are clear losers

REFLATION

OUT-PERFORMS		Bonds	Stocks	Commodities	Cash
	Bonds	-	58.7%	97.3%	**95.5%**
	Stocks	41.3%	-	91.8%	70.4%
	Commodities	2.7%	8.2%	-	6.6%
	Cash	4.5%	29.6%	93.4%	-

(header row under REFLATION reads: UNDERPERFORMS)

In Recovery, Stocks dominate; Commodities and Cash are the losers

RECOVERY

OUT-PERFORMS		Bonds	Stocks	Commodities	Cash
	Bonds	-	0.2%	**99.8%**	**99.9%**
	Stocks	**99.8%**	-	**100.0%**	**100.0%**
	Commodities	0.2%	0.0%	-	2.2%
	Cash	0.1%	0.0%	**97.8%**	-

(header row under RECOVERY reads: UNDERPERFORMS)

In Overheat, Commodities are clear winners; Bonds do poorly

OVERHEAT

OUT-PERFORMS		Bonds	Stocks	Commodities	Cash
	Bonds	-	9.3%	0.0%	29.7%
	Stocks	90.7%	-	3.3%	87.1%
	Commodities	**100.0%**	**96.7%**	-	**100.0%**
	Cash	70.3%	12.9%	0.0%	-

(header row under OVERHEAT reads: UNDERPERFORMS)

In Stagflation, Commodities (led by oil) and Cash are winners; Stocks are clear losers

STAGFLATION

OUT-PERFORMS		Bonds	Stocks	Commodities	Cash
	Bonds	-	93.7%	0.1%	25.1%
	Stocks	6.3%	-	0.0%	4.0%
	Commodities	**99.9%**	**100.0%**	-	**99.9%**
	Cash	74.9%	**96.0%**	0.1%	-

(header row under STAGFLATION reads: UNDERPERFORMS)

Note: The table shows the confidence levels of one-sided paired t-tests (the probability that we accept the relationship). Figures in Bold denote confidence levels of more than 95%, those in circles, asset pairs that are "Clock Opposites".

U.S. Sectors Relative to the Market

We look at the statistical properties of the broad equity sector returns relative to the U.S. market using the same approach we apply to asset returns.

Analysis of Variance

The ANOVA for relative sector returns shows whether the Investment Clock phases say something useful about a given sector over time.

The Investment Clock has a strong message for about half of the ten broad U.S. equity sectors

Table 17: U.S. Broad Sector Relative Returns – One-Way ANOVA

	Consumer Discretionary	Oil & Gas	Consumer Staples	Pharma	Technology
F-Stat	6.54	3.67	2.58	2.20	2.19
Confidence Level	**99.9%**	**98.8%**	**94.7%**	**91.3%**	**91.1%**

	Financials	Industrials	Telecoms	Utilities	Basic Materials
F-Stat	1.63	1.63	1.10	0.92	0.35
Confidence Level	87.8%	81.8%	65.3%	56.8%	21.3%

Note: Figures in Bold denote confidence levels of more than 90%.

The Clock has a strong message for half of the ten sectors, but in most cases the confidence levels are much lower than for asset returns. Consumer Discretionary and Oil & Gas stand out as macro-driven sectors. Telecoms, Utilities and, surprisingly, Basic Materials are poorly explained by the model.

T-Tests

We use one-sided t-tests for each possible pair of sectors (Table 18). Here are some of the most significant outperformance relationships in each phase.

One-sided t-tests identify forty 95% significant pair trades across the four phases

I. **Reflation:** Staples, Financials and Consumer Discretionary stocks outperform Industrials, Oil & Gas, Tech and Telecoms.

II. **Recovery:** Consumer Discretionary outperforms Staples and Pharma. Telecoms beat Staples and Utilities.

III. **Overheat:** Industrials, Tech, Oil & Gas, Pharma and Staples outperform Consumer Discretionary. Industrials beat Financials.

IV. **Stagflation:** Oil & Gas beats almost everything. Pharma, Utilities and Staples outperform Consumer Discretionary and Tech.

Table 18: U.S. Broad Sector Relative Returns – Paired T-Tests

REFLATION

In Reflation, Defensives and interest-rate sensitives outperform

OUTPERFORMS	UNDERPERFORMS					
	Industrials	Telecoms	Technology	Oil & Gas	Basic Materials	Utilities
Consumer Discretionary	**99.8%**	**98.9%**	**98.6%**	**96.8%**	**95.2%**	92.4%
Financials	**99.4%**	**99.6%**	**97.7%**	**97.6%**	92.9%	**95.6%**
Staples	**99.1%**	**99.5%**	**96.7%**	**98.7%**	**95.5%**	**98.2%**
Pharma	-	90.9%	-	91.7%	-	-
Basic Materials	-	-	-	90.3%	-	

RECOVERY

In Recovery, Telecoms stocks do well, reflecting their "Growth Cyclical" characteristics of the late 1990s

OUTPERFORMS	UNDERPERFORMS			
	Staples	Pharma	Utilities	Oil & Gas
Consumer Discretionary	**97.5%**	**95.1%**	-	-
Telecoms	**95.3%**	94.1%	**95.1%**	91.4%
Financials	91.7%	-	-	-
Technology	-	91.1%	-	-

OVERHEAT

In Overheat, the clearest message is the very poor performance of Consumer Discretionary stocks

OUTPERFORMS	UNDERPERFORMS			
	Consumer Discretionary	Basic Materials	Financials	Utilities
Industrials	**99.9%**	**97.5%**	93.8%	-
Technology	**98.4%**	90.5%	-	-
Pharma	**97.3%**	-	-	-
Oil & Gas	**96.2%**	92.3%	-	92.2%
Staples	**95.8%**	-	-	-

STAGFLATION

In Stagflation, Energy stocks and Defensives outperform

OUTPERFORMS	UNDERPERFORMS					
	Consumer Discretion.	Technology	Industrials	Financials	Telecoms	Basic Materials
Oil & Gas	**99.8%**	**99.2%**	**95.8%**	**95.0%**	94.4%	91.9%
Pharma	**99.7%**	**99.3%**	92.6%	91.4%	90.3%	-
Industrials	**98.7%**	**97.2%**	-	-	-	-
Basic Materials	**97.8%**	91.4%	-	-	-	-
Utilities	**97.2%**	**95.5%**	-	-	-	-
Staples	**97.0%**	91.3%	-	-	-	-
Financials	**96.9%**	92.3%	-	-	-	-

Note: The table shows the confidence levels of one-sided paired t-tests (the probability that we accept the relationship). We show all the pairs with confidence levels of at least 90%. Figures in Bold denote confidence levels of more than 95%.

Fixed Income

Analysis of Variance

The ANOVA test shows that the yield curve level is strongly associated with the economic cycle; the slope less so.

The yield curve level is strongly associated with the economic cycle; the slope less so

Table 19: Yield Curve – One Way ANOVA

	Yield Curve Level	Yield Curve Slope
F-Stat	2.66	1.63
Confidence Level	**95.2%**	81.8%

Note: Figures in Bold denote confidence levels of more than 90%.

T-Tests

Only the "Bull Steepening" in Reflation survives the t-test with 95% confidence.

Table 20: Yield Curve – Summary of T-Tests

Phase		Yield Curve Level		Yield Curve Slope	
		Phase	**Confidence**	**Phase**	**Confidence**
I	Reflation	**Bull**	**95.4%**	**Steepening**	**96.1%**
II	Recovery	Bull	74.5%	Steepening	15.7%
III	Overheat	Bear	87.4%	Flattening	52.4%
IV	Stagflation	Bear	48.4%	Flattening	32.7%

Only the Bull Steepening in Reflation survives the t-test

Note: The table shows the confidence levels of one-sided t-tests (the probability that we accept the relationship). Figures in Bold denote confidence levels of more than 95%.

Foreign Exchange

Analysis of Variance

The ANOVA confidence levels for foreign exchange rates are strong for half of the crosses we consider, particularly those including the yen or Australian dollar.

Asian foreign exchange crosses show a strong link to the U.S. economic cycle

Table 21: Bilateral Exchange Rates – One Way ANOVA

	EUR per JPY	USD per AUD	USD per JPY	USD per GBP	CHF per AUD	USD per EUR	USD per ZAR	USD per CAD
F-Stat	3.85	3.68	3.30	2.32	1.45	1.47	1.26	0.65
Confidence	**99.6%**	**98.8%**	**98.0%**	**93.5%**	78.4%	77.7%	71.4%	42.0%

Note: Figures in Bold denote confidence levels of more than 90%.

T-Tests

There are relatively few significant results when we look at t-tests. The most consistent pattern is the strength of Asian currencies during a U.S. overheat.

Table 22: Bilateral Exchange Rates – Summary of T-Tests

The U.S. dollar is strong during Reflation and Recovery, but the statistics are patchy

We can be more confident in saying that the yen and Aussie dollar are Overheat currencies

	Reflation		Recovery		Overheat		Stagflation	
	Strong	Conf.	Strong	Conf.	Strong	Conf.	Strong	Conf.
USD per GBP	*USD*	82.2%	*USD*	83.5%	*GBP*	92.2%	*GBP*	30.2%
USD per EUR	*USD*	94.2%	*USD*	26.4%	*EUR*	45.3%	*EUR*	48.1%
USD per JPY	*USD*	29.6%	*JPY*	89.5%	**JPY**	**96.9%**	**USD**	**93.8%**
USD per AUD	*USD*	21.8%	**USD**	**97.6%**	**AUD**	**97.0%**	*USD*	85.5%
USD per CAD	*USD*	24.7%	*USD*	88.5%	*CAD*	8.1%	*CAD*	24.2%
USD per ZAR	***USD***	**96.9%**	**USD**	**95.9%**	*USD*	52.5%	*ZAR*	9.9%
EUR per JPY	*JPY*	88.2%	**JPY**	**98.0%**	**JPY**	**95.5%**	**EUR**	**99.0%**
CHF per AUD	*AUD*	47.8%	**CHF**	**96.5%**	*AUD*	23.2%	**CHF**	**95.8%**

Note: The table shows the confidence levels of one-sided t-tests (the probability that we accept the relationship). Figures in Bold denote confidence levels of more than 95%.

Merrill Lynch

Equity Country Returns vs. the World

Analysis of Variance

The confidence levels for an analysis of unhedged country returns versus the world are similar in magnitude to those for U.S. sectors. This is a positive surprise, given that we are looking only at the U.S. economic cycle to classify the phases.

The Investment Clock has a strong message for about half of the ten equity countries

Table 23: Equity Country Returns vs. the World – One Way ANOVA

	Canada	Eurozone	Japan	U.S.	South Africa
F-Stat	4.73	3.33	2.53	2.52	2.24
Confidence Level	**99.7%**	**98.1%**	**94.6%**	**94.3%**	**91.7%**

	Singapore	Australia	Switzerland	UK	Hong Kong
F-Stat	1.50	1.15	1.07	0.38	0.38
Confidence Level	78.7%	67.1%	63.7%	23.4%	23.2%

Note: Figures in Bold denote confidence levels of more than 90%.

Paired T-Tests

Here are the most significant country outperformance relationships in each phase.

Table 24: Equity Country Returns vs. the World – Paired T-Tests

In Reflation, Singapore, the U.S. and the UK tend to outperform

REFLATION	UNDERPERFORMS				
OUT-PERFORMS	Eurozone	Japan	Switzerland	Canada	Australia
UK	**99.2%**	**99.1%**	**98.3%**	94.0%	-
Singapore	**96.4%**	**98.3%**	**97.7%**	**95.5%**	93.3%
U.S.	-	92.5%	-	-	-

In Recovery, a mixed bag of Hong Kong, Switzerland and the Eurozone does best

RECOVERY	UNDERPERFORMS			
OUT-PERFORMS	Canada	Japan	U.S.	Singapore
Eurozone	**99.9%**	**99.4%**	**95.2%**	94.1%
Switzerland	**98.4%**	**96.6%**	-	-
Hong Kong	**97.8%**	**97.9%**	91.9%	**98.5%**
U.S.	**97.2%**	-	-	-

In Overheat, Asian equities do well but there are no patterns with strong statistical support

OVERHEAT	UNDERPERFORMS		
OUT-PERFORMS	Switzerland	U.S.	Eurozone
Hong Kong	90.0%	(89.7%)	(87.1%)
UK	(89.5%)	(88.6%)	(83.3%)
Japan	(83.9%)	(82.3%)	-

In Stagflation, the resource markets of South Africa, Canada and Australia are among the top performers

STAGFLATION	UNDERPERFORMS						
OUT-PERFORMS	Japan	Switz'land	Eurozone	UK	Singapore	U.S.	Hong Kong
South Africa	**99.4%**	**99.2%**	**98.7%**	**98.3%**	**97.7%**	**97.5%**	94.6%
Australia	**98.1%**	-	-	-	**95.0%**	-	-
Canada	**97.6%**	**97.1%**	93.2%	93.4%	93.9%	93.4%	-

Note: The table shows the confidence levels of one-sided paired t-tests (the probability that we accept the relationship). We show all the pairs with confidence levels of at least 90%. Figures in Bold denote confidence levels of more than 95%. Figures in brackets denote confidence levels between 80% and 90%.

Refer to important disclosures on page 28.

Certifications & Disclaimers

Coverage Disclaimer

Due to the nature of strategic analysis, the issuers or securities recommended or discussed in this report are not continuously followed. Accordingly, investors must regard this report as providing stand-alone analysis and should not expect continuing analysis or additional reports relating to such issuers and/or securities.

Notes to Readers

The comments and views expressed in this document are those of the Strategy Team and do not necessarily coincide with those of the Merrill Lynch fundamental analysts.

Important Disclosures

Investment Rating Distribution: Global Group (as of 30 September 2004)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	1095	44.05%	Buy	374	34.16%
Neutral	1207	48.55%	Neutral	333	27.59%
Sell	184	7.40%	Sell	37	20.11%

* Companies in respect of which MLPF&S or an affiliate has received compensation for investment banking services within the past 12 months.

FUNDAMENTAL EQUITY OPINION KEY: Opinions include a Volatility Risk Rating, an Investment Rating and an Income Rating. VOLATILITY RISK RATINGS, indicators of potential price fluctuation, are: A - Low, B - Medium, and C - High. INVESTMENT RATINGS, indicators of expected total return (price appreciation plus yield) within the 12-month period from the date of the initial rating, are: 1 - Buy (10% or more for Low and Medium Volatility Risk Securities - 20% or more for High Volatility Risk securities); 2 - Neutral (0-10% for Low and Medium Volatility Risk securities - 0-20% for High Volatility Risk securities); 3 - Sell (negative return); and 6 - No Rating. INCOME RATINGS, indicators of potential cash dividends, are: 7 - same/higher (dividend considered to be secure); 8 - same/lower (dividend not considered to be secure); and 9 - pays no cash dividend.

The analyst(s) responsible for covering the securities in this report receive compensation based upon, among other factors, the overall profitability of Merrill Lynch, including profits derived from investment banking revenues.

Refer to important disclosures on page 28.