



# COLBY ECONOMIC OUTLOOK

## ECONOMIC PROJECTIONS FOR THE U.S. & MAINE ECONOMIES

VOLUME 10 ISSUE 2

COLBY COLLEGE, WATERTVILLE, ME

MAY 10, 2002

### THE NEW MAINE ECONOMY

BY EDMOND WATTERS & JUSTIN UCKO

The Maine economy has traditionally been very different from that of the U.S. Due to abundant natural resources, Maine's economy has historically been dependent upon agriculture and manufacturing. In the past ten years Maine has undergone a significant structural change, becoming a more service and information-based economy. Accordingly, the Maine economy now follows that of the U.S. more closely than ever. The effects of this transition have been positive for the overall Maine economy, and should provide good opportunities for continued growth. The downside of the transition has been felt by the manufacturing sector.

This article explores the future of the Maine economy through 2003. In order to forecast the state's economy, its important components must first be examined. Employment numbers have historically been a driving force in the state, and have an important role on economic conditions. Other important economic factors include personal income, tourism, and retail sales. The future of Maine's economy can be analyzed by forecasting each of these components and incorporating them into an index, as shown below.

A close look at the Maine economy reveals room for growth in total employment. However, this is a general indicator and does not give insight into the different sectors of the economy. Total employment can be divided into two distinct groups: manufacturing and non-manufacturing labor. It is essential to first look at these separately in order to understand the dynamics behind the total employment variable.

### MANUFACTURING

Historically, Maine has predominantly been a manufacturing state. During this period high school graduates would immediately get a job in this sector, move up the ladder, and live comfortable lives. This

was the case for many years until the 1960's, when global competition started to deteriorate the manufacturing industries throughout New England. Manufacturing accounted for 50% of Maine's employment in the 50's, but has decreased to just 15% today. Maine has particularly suffered from this global competition in recent years. In the year from February 2001 through February 2002, Maine lost 6,800 manufacturing jobs as many companies closed. This trend explains

Maine Employment			
Annual Growth Rates			
Year	Total	Manufacturing	Non-Manufac.
2000	2.93%	-1.21%	3.65%
2001	1.07%	-4.62%	2.00%
2002*	1.63%	-3.14%	2.37%
2003*	2.44%	0.43%	2.73%

\*Forecasted Years

why manufacturing employment has been hit hard in the past two years. The decline in 2002 can be explained by the announced closing of manufacturers such as Nautica, Hathaway, and MeadWestvaco Corp., which alone will put 644 people out of work. The small positive growth in 2003 will likely be due to investments such as the \$45.6 million in projects by SAPPI and Madison Paper Company. Bath Iron Works has also announced increased investment in response to the defense spending frenzy following 9/11. However, the downward trend is the important

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Edited by Isil Müderrisoglu

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reality of manufacturing in Maine. This sector is disappearing, leaving thousands standing in unemployment lines.

**AN INFORMATION-BASED ECONOMY**

The manufacturing has gradually been replaced by a service and information-based economy. Nine of the ten largest private employers in Maine are in the service sector. They include two large retailers, three hospitals, two grocers, a credit card company and an insurance company. Technology industries are also a significant part of Maine’s economy due to the presence of large semiconductor companies such as Fairchild Semiconductor and software companies like DeLorme Mapping. This sector of the economy has experienced strong employment growth in the past eleven years, as seen in 2000 and 2001. This growth is expected to increase slightly over the coming years. The future growth will stem from a large demand for more skilled labor. The labor force has decreased in Maine as the population has aged. Most promising young people are leaving the state and there is a large immigration of senior citizens. Furthermore, Maine has one of the worst state records for post-secondary education. Accordingly, to fill jobs, many companies are offering full educational payments and signing bonuses. Nurses are being brought in from Canada. The Maine Medal Products Association reports more than 2000 well-paying positions are unfilled resulting from the lack of existing demanded laborers in Maine. This excess demand will continue to attract employees, which is represented by the forecasted growth in the two coming years.

The analysis of the two sectors of employment allows a clear understanding of the reality behind the data. Total employment has grown with the addition of 50,000 jobs since 1998. The relatively low growth in 2001 was due to the decrease in national growth felt throughout parts of the same year. The slowdown is largely perceived as over, and accordingly the total employment forecasts for 2002 and 2003 are optimistic. This essentially means that growth in the service and information sector is dominating that in the manufacturing sector. The result is positive growth.

The problem with this situation from the perspective of Mainers is that outsiders will fill many of these jobs. This is because most locals simply are not able to perform the tasks necessary to land these available jobs. So, although state statistics will be inflated by an influx of higher paid individuals, there are many current residents of the state that will be

unable to find employment. As the manufacturers continue to close, large groups of individuals and portions of the state will be in duress. Although statistics will mask this problem, it will be felt strongly in the northern two thirds of the state where manufacturing jobs are the primary occupation. In these large areas the economy will be stagnant, and employment will be extremely low. Education is more important than ever in Maine.

**INCOME**

Another important component of Maine’s economy is personal income. The increase in

Income Growth	
Year	Annual Growth
2000	5.50%
2001	6.38%
2002*	4.26%
2003*	4.91%
*Forecasted Years	

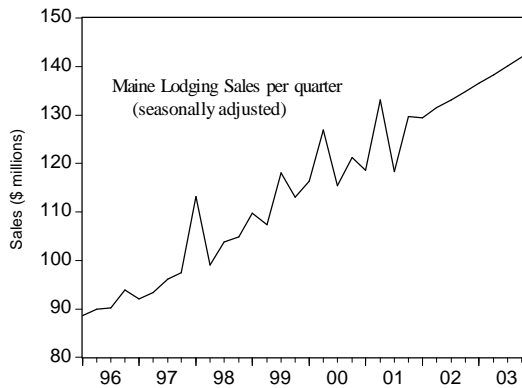
2000-1 is largely a result of the fore-mentioned transition from manufacturing to a service and information-based economy. These new types of employment generally have higher salaries than

manufacturing. This has increased income in the past years, and will contribute to increases in the upcoming years.

Although at a slower rate than the past two years, the future shows continued growth. The majority of this increase will be due to the current excess demand for labor. It has already pushed wages up and will continue to do so until enough labor is present to establish a stable market equilibrium. Both the increases in wages and the influx of laborers will be the important causes of income growth in the next two years.

**TOURISM**

The tourism industry, which is represented here by a lodging forecast, will continue to prosper in the coming years. This has been one of the fastest growing sectors since the early 90’s. In 2000, an estimated 77,000 jobs were supported exclusively by this segment of the economy. The continued growth will largely be fueled with the return of a passenger rail service for the first time since the 60’s. Passenger levels have been high on the four daily trains in each direction between Boston and Portland. The return of rail travel has induced travel firms to offer package deals that allow the visitation of both cities at low costs. A second reason that the tourism sector is expected



to grow is due to a September eleventh effect. Not only are Americans induced to vacation within the United States, but the events have also led many to avoid air travel all together. The combination of these factors will greatly benefit tourism in Maine, which is a popular destination on the east coast, and is easily accessible by car or train. With an already successful tourism history, "Vacationland", has recently built 30 new golf courses to help attract more summer visitors. Combined with two of the most popular ski mountains in the East (Sugarloaf and Sunday River), Maine continues to build a strong hold with year-long tourist attractions.

### RETAIL SALES

Retail sales will continue growing in the upcoming years. Although 2001 showed slower growth for retail sales, it will pick back up as the national economy recovers from the past years slowdown. Although the growth will not be at the 10% levels of the late 90's, a promising future lies ahead.

There are two major forces behind the expected increase in growth. The first reason is the fore-mentioned increase in tourism. This industry is tightly related to retail sales in the state of Maine, and will account for a large portion of the growth. Secondly, the increase in income should boost local consumption in the years to come. One possible detrimental factor is that Mainers have extremely high debt to disposable income ratios. Overdrawn credit cards and bankruptcy will slow the consumption of some individuals. However, intuition suggests that the two positive factors, which are more representative of consumption, will far outweigh the negative one, and growth in retail sales will continue.

### COLBY COINCIDENCE INDEX

In order to give a general measure of the Maine economy we compiled forecasts for the variables that

drive the Maine economy. Then by weighting each of these variables according to historic trends an index can be compiled to represent the entire state's economy. This index

Colby Coincidence Index	
Year	Annual Growth
2000	3.45%
2001	1.81%
2002*	2.45%
2003*	2.94%
*Forecasted Years	

is called the Colby Coincidence Index and the base year is 1996. It looks not only at tourism, retail sales, income, and employment numbers mentioned above, but also incorporates the hours worked in the

manufacturing sector. A look at the forecast of the index shows that the various aspects discussed above lead to a promising economy as a whole. Although the good times ahead might be focused on certain aspects of the economy and drown out the struggling manufacturing workers, the influx of capital and the subsequent increases in investment predict a good future for the state as a whole. The promising future is a result of the promising national GDP numbers seen throughout this issue. Thanks to the new Maine economy the state will share in this promising future.

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## POST-RECESSION UNEMPLOYMENT

An exploration of Okun's Law:  
Does the Output Gap Predict Unemployment?

BY MATT OVERTON, JONATHAN RYDER, CARL TUGBERK & PETER MORELLI

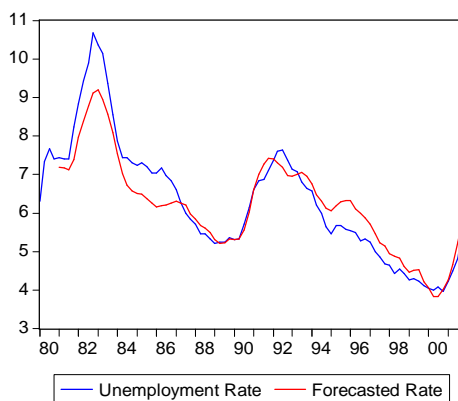
It has long been known that a significant relationship exists between cyclical fluctuations in output and unemployment rates. Okun's law is a mathematical representation of that relationship which hypothesizes the unemployment rate to be a function of the output gap, the difference between output and potential output.

This relationship is exceptionally intuitive, in that, for production to exceed its potential level the economy must be pushed beyond its ordinary capacity for involvement, and unemployment rates would be expected to decline below so-called 'natural levels.' Corrections in the business cycle should of course be expected to have a parallel and opposite effect on employment. The rate of

unemployment is therefore expected to be negatively dependent on the output gap.

To empirically test the validity of this law over the last two decades, a forecasting model was estimated predicting the rate of unemployment as a function of the difference between real actual and potential gross domestic product, three periods of lagged values of this gap, and a one period auto regressive term to correct for serial correlation among the gap variables. It was found that between 1981:1 and 2001:4, this model very accurately predicted the level of, as well as the growth rate of, the national unemployment rate.

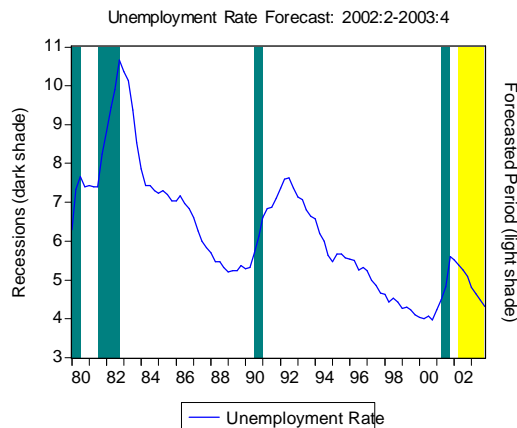
*National Unemployment Forecast: Model*



### UNEMPLOYMENT FORECAST

During the recession of 2001, unemployment rose from 4.5% in the second quarter to 5.6% by December. As evidenced by current reductions in unemployment and increased GDP growth for 2002:1, the U.S. economy has begun to recover. Expect to observe sustained falling unemployment rates through 2003.

This model predicts an employment rate of approximately 5.1% by year-end 2002, a rate drop of



0.5 from the current rate. An additional 14% rate drop is expected

to lower unemployment to 4.3% by the completion of 2003.

This forecast was produced prior to the release of first quarter 2002 unemployment data. With a predicted rate of approximately 5.5%, this model slightly under predicted the actual unemployment rate of 6%. While this forecast appears to be slightly premature in its initial prediction of economic recovery, unemployment is expected to follow the forecast closely in the following periods. Additionally, no significant historical lag was found in post-recession unemployment reduction. Our prediction of an immediate unemployment turnaround is consistent with observed first quarter behavior.

A declining overall trend in unemployment is observed from the 1980-81 recession through the present. This can be attributed to improved telecommunications and readily available Internet access across the U.S.; providing a closer link between employees and employers, reducing the searching and hiring costs imposed on both parties, and effectively lowering the frictional rate of unemployment.

### UNEMPLOYMENT RATE FORECAST FOR 20-24 YEAR OLDS

As a result of the 2001 recession, the job market has steadily shrunk causing a rise in total unemployment. This reduction in available jobs has most sharply affected the 20-24 year old segment of the population causing the unemployment rate for this sector to rise to 9.7% in the first quarter of 2002. Specifically, firms are hiring at a much lower rate due to reduced production, and when they do add personnel, they are seeking more experienced members of the labor force. Dean of Columbia Career Services, Christopher Pratt, says, "The number of on-campus interviews by firms looking for new employees is down by half since last year." In response to this unfavorable job market, students of the class of 2002 and their most recent predecessors have turned to graduate schools. For instance, law school applications have increased by approximately 20% this year. Unfortunately, graduate schools have not been the answer for everyone, and many young, highly educated individuals still are left unemployed.

Despite these recent troubles for 20-24 year olds, the economy appears to be recovering slowly, and the Class of 2003 should have more

favorable conditions when entering the job market next spring. Specifically, we predict that the unemployment rate for 20-24 year olds will begin reducing in the second quarter of 2002 and should continue to throughout the entirety of 2003. We expect the rate to fall to approximately 7.5% in the second quarter of 2003 as firms adjust to the recovering economy and increase the amount of available new positions in the market. Finally, by the end of 2003, we predict that the unemployment rate of 20-24 year olds will have fallen by approximately 27% from a current peak of 9.7% to roughly 7.1%.

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## **WHAT IS THE FED TO DO?**

BY WARD SAVAGE AND JASON GIMBEL

During the past 18 months, we have been witness to economic activity that not even the most respected economic minds could have anticipated. Granted that external shocks, such as September 11<sup>th</sup>, the increased tensions in the Middle East, the Enron scandal, and the accounting problems of so many companies could never have been expected, it is a fact that this is what the American economic policy makers, specifically Alan Greenspan, face and are forced to deal with.

Chairman Greenspan and the FOMC, through open market operations can control poor growth or inflation through adjustments in interest rates. If our economy is growing too quickly and inflationary pressure is present, Greenspan can raise interest rates as an incentive for people to slow project investment through a higher return in the money market. Likewise, if the economy is stalling, Greenspan can lower interest rates, creating an incentive for borrowing and taking on investment opportunities to help jump start the economy.

After the unprecedented eleven rate cuts in 2001, the current federal funds rate for the first quarter of 2002 is at a forty year low target value of 1.75. With our economy "crawling" out of the most recent recession, we are expecting that as the economy becomes more productive, there will be inflationary pressure that will lead the Fed to slowly raise the federal funds rate in the second half of 2002 and again in the upcoming 2003 year.

In our federal funds reaction model, we decided to include variables that seemed to most likely affect the Fed's decision to adjust the fed funds rate. We incorporated a variable to measure inflation, another to measure the difference between actual and potential real GDP, and one more to measure economic policy.

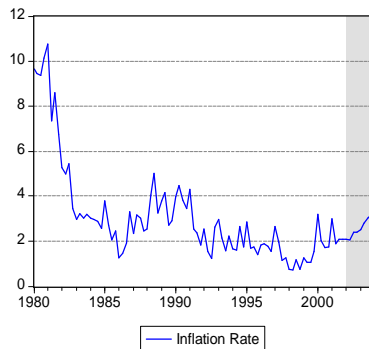
Since the federal funds rate is indicative of monetary policy, we chose to include another measure of monetary direction, the discount rate, since it is also in part determined by the federal funds rate. The discount rate is the rate the Federal Reserve charges banks for overnight loans.

In order to forecast the fed funds rate, we first needed to first forecast the variables that it is dependent on. We are expecting real GDP growth in the upcoming forecasted quarters to grow at a little bit faster rate than the real potential GDP growth as forecasted by the government. Thus, we are forecasting an increase in the value of this ratio. With regards to the discount rate forecast, we think that the Federal Reserve will keep the discount rate at its current Q1 level of 1.25% for the next two quarters of 2002 and then increase it by 25 basis points in the final quarter. During 2003, we expect the Fed to continue with cautionary policy by leaving the discount rate steady at 1.50% for the first two quarters, and then as growth increases, we forecast the Fed to raise the rate by another 25 basis points to 1.75%. The forecast for inflation, a bit more complicated, is explained below.

## **FORECAST OF INFLATION**

During the majority of the past ten years the U.S. economy has roared through one of its greatest periods of growth in which inflation was only a minor issue, as it remained near record lows for a number of years. Now, however, as we come out of a minor recession and downturn, and as the economy begins its revival, inflation fears are once again in the minds of policy makers, most notably the Federal Reserve Chairman Alan Greenspan. It will be necessary for the Fed to have a watchful eye on the level of inflation during the early part of 2002, as it attempts to pin point the correct moment when it needs to take it's foot off the accelerator, and discourage the U.S. economy from overheating. By understanding how inflation will change in the coming years, we can more easily comprehend how the Fed will use its most useful tool, the Fed Funds Rate, in the near future. In order to accomplish this we have taken a modified version of the Phillips Curve and used it to form a forecast of inflation in the U.S. through the end of 2003. The three most important features of this Phillips Curve model that determined our forecast were, a measure

productivity growth in the U.S., the level of unemployment, and a measure of inflation differential between the U.S. and abroad.

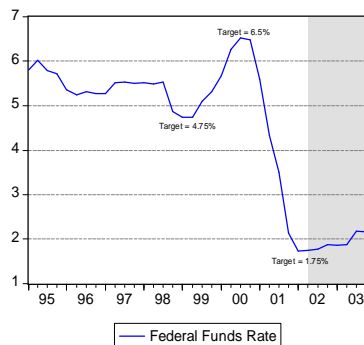


2001:1	2.992643
2001:2	1.872433
2001:3	2.089092
2001:4	2.102515
2002:1	2.095420
2002:2	2.063812
2002:3	2.371839
2002:4	2.404028
2003:1	2.498209
2003:2	2.806081
2003:3	3.027036
2003:4	3.159944

We expect that the economy will continue to recover during the first half of 2002, and with this, a continued modest increase in inflation will be seen over the forecast horizon. While we expect inflation to rise, we do not foresee an increase to dangerous levels, as inflation will still stand below 3.25% at the end of 2003, a very modest level in historical terms.

### THE FEDERAL FUNDS RATE

Using our forecast for inflation, along with the forecasts of the discount rate and the GDP output gap, we established a forecast of the federal funds rate for the last three quarters of 2002 and all four quarters of 2003. With an anticipated economic recovery, albeit slow, we are forecasting the Fed to have to increase the targeted rate by 50 basis points over the entire period. This forecast is neither optimistic nor overly pessimistic, but rather in the middle of what most economists expect. As shown below the federal funds rate will approach the targeted rates in the fourth quarter of 2002 (2.00%) and the third quarter of 2003 (2.25%), the times that we expect the Fed to raise the targeted rate.



In conclusion, as we come out of the recession of 2001, and our GDP numbers begin to show more growth, we anticipate modest inflationary pressure forcing the Fed to react by raising interest rate targets above the current record low values as a means

of keeping a handle on what we hope to be a strong recovery.

## CONSUMPTION

BY SAMIR PATEL

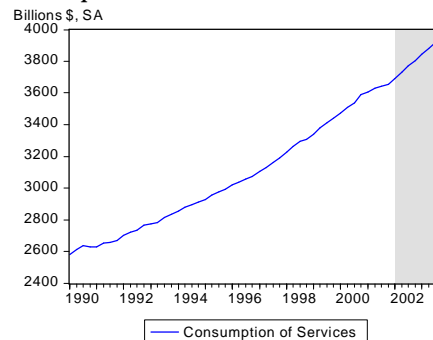
Over the past 10 years the U.S. consumption sector has, until recently, exhibited very high levels of growth. During this unprecedented period of expansion, many economists wondered whether the growth rates were sustainable. With the bursting of the technological bubble, and the September 11<sup>th</sup> attacks, there has been downward pressure on the growth rates of the consumption sectors; namely durables, non-durables, and services.

The explanatory variables that proved most influential in the forecasts of consumption were real disposable income and consumer sentiment. We would expect a positive relationship with the dependent consumption sectors for both variables, as more income or confidence in the economy will spur spending.

While real disposable income was an exogenous variable, consumer sentiment was formulated, including a mix of government fiscal balance, the rate of growth of gross business product (a proxy for inflation), and the unemployment rate.

### CONSUMPTION OF SERVICES

The service sector has shown to be the least volatile component of overall consumption. We would expect this as services are more essential in an economy, and are less likely to fluctuate due to changes in disposable income, than other sectors of consumption.



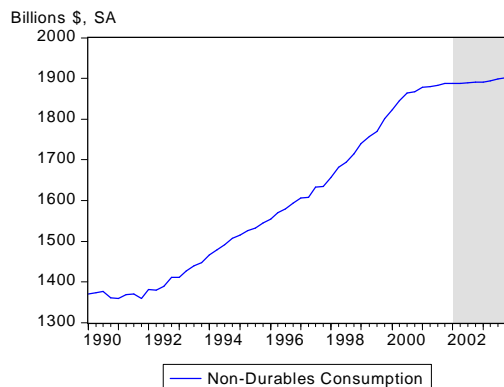
It is also relatively larger in size (approximately 50% of total consumption). The effects of the economic downturn were least visible in the service sector, reducing the rate of growth by

.092% for 2001. The forecast predicts annualized growth in the 3 to 3.5% range over the forecast horizon, which is from the first quarter of 2002, through the fourth quarter of 2003. This estimate is consistent with historical growth rates of the service sector, as can be seen in the graph above.

### NON-DURABLES

The non-durables sector has exhibited stronger historic growth patterns than the service sector. In recent times, there has been a significant reduction in the rate of growth, although it has remained non-negative. Due to the irregular time pattern of purchases of non-durables, we would expect less volatile growth than in that of non-durables, which are purchased on a much more frequent basis. The largest decrease in annual growth rates of non-durables occurred between 2000 and 2001, just as in the service sector, with a 2.84 unit decrease in the growth rate.

The forecast for non-durables predicts a continued small and positive level of the growth, around .32% in 2002, and .45% in 2003. This estimate seems quite plausible, as a downturn is not predicted for the future economy, but neither is large growth levels.



While critics may argue larger growth should be expected in 2003, the forecasts of higher inflation, which would cause prices of non-durables to increase, is keeping the growth levels lower for the 2003 time period. The forecast predicts a 1.36 unit decrease in the annual growth rate for 2002.

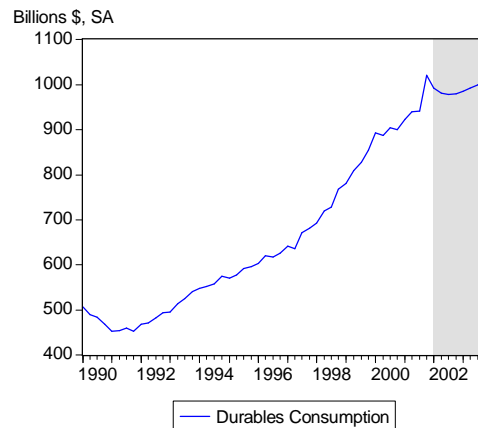
### DURABLES

The durables sector has proven to be the least stable sector of consumption. For an explanation, we can consider consumers in a recessionary time period. They will be able to substitute away from the more expensive durables, in a manner they would be unable to do in the service sector, with for example car repair

service. This explains the larger sensitivity of the durables division to changes in output.

While historically there has been strong growth patterns, the data from the first quarter of 2000 shows the first lowering of the growth rate from a 1999 annual growth value of 11.16% to 8.68% in 2000, and 6.1% in 2001. The durables sector was also the first one to feel the filtered macroeconomic effects of the economic downturn period. The forecast for durables was impacted by a large and positive increase in the fourth quarter of 2001.

Negative growth is predicted for the first half of 2002, but as durables growth increases, we should expect a 2.82% annual rate of growth for 2002, a 3.28 unit decrease in the rate of growth from 2001. This is consistent with our understanding of unsustainable growth levels. We



would expect a decrease in growth from a low forecast of consumer sentiment (wartime situations cause global uncertainty). For 2003 the forecast is for growth in the 1.3% range, a low level that will pick up near the end of 2003.

### TOTAL CONSUMPTION

Overall, we expect consumption to be increasing over the next 2 years. After the fourth quarter of 2002, we expect a rate of growth starting around 1% that will increase at a decreasing rate through the fourth quarter of 2003. As noted before, the service sector takes up approximately 57% of total consumption, with non-durables accounting for around 26%, and durables around 17%. The table to the right indicates the forecasted total consumption levels, as well as the forecasted annual rates of growth.

As can be seen we predict positive growth for all the forecasted periods, as we would suspect.



The 2 to 3% growth levels imply a reverting of the U.S. economy to its less sensitive consumption prior to the high growth levels of the last 10 years.

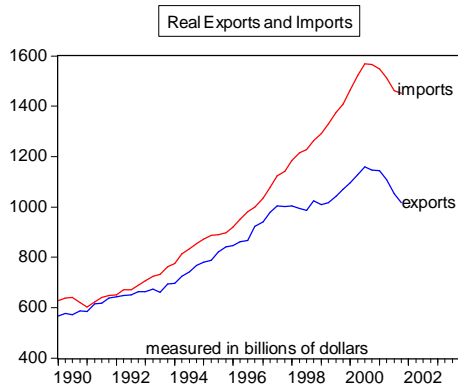
This seems credible, as the technology sector's diminishment as the powerhouse of the U.S. economy has reduced overall value in the economy as well as value in dot-com enterprises. This has reduced the net worth, as well as the consumer confidence of many citizens. This impact will affect future consumption levels, leading to lower levels of growth.

## THE U.S. TRADE BALANCE: A POSITIVE OUTLOOK?

BY KATHLEEN CARNEY & CHRISTINE COLLOPY

In the past years, much discussion has been generated on the rapidly widening United States trade deficit. The trade deficit has been increasing as imports have increased at an exponential rate through the 1990s. Through the 1990s exports were also increasing, however they were not increasing fast enough to keep pace with seemingly insatiable American demand for imports.

In the real imports and exports graph, the widening gap between imports and exports can



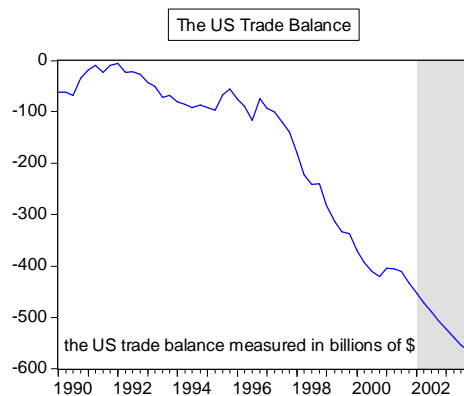
visibly be noted. It should be observed that in 2001, both imports and exports begin to fall; this may be attributed to the recessionary world economy.

Most recently, although both exports and imports are decreasing, the gap between them appears to still be widening; in other words the trade balance has been decreasing. It was our ambition to forecast the trade balance for the United States, and we determined that the trade balance is expected to continue to decrease through 2003. On average, from 1991 to 2001 there has been a 47% yearly decrease in the trade balance. Only in one year, 1995, did the trade balance actually increase. For this reason it is logical to assume

that the trade balance will continue to decrease through 2003. This forecast is based on recent trends, trends that we assume, for the purpose of this model, will persist. It is important to note however, that much discussion and debate currently exists about whether the U.S. can continue like this and for how long. We also recognize that most recently the dollar has reportedly depreciated a signal that our forecast maybe on the pessimistic side. Having said that, we proceed with the trends of the last few years and give you a worst-case scenario.

## EFFECTS OF THE EXCHANGE RATE

The trade balance is defined as exports minus imports, so to determine the trade balance, a forecast had to be made for both real exports and real imports. As money markets and commodity markets are innately bound together, exchange rates were an important variable used to determine both imports and exports. Much like stock prices, exchange rates are extremely difficult to forecast because they rely heavily on random chance events. Exports and imports are therefore tied to these random events within the money markets. Since 1995, the American dollar has been appreciating against a trade-weighted exchange rate. This appreciation has made American goods look expensive in international markets because as the dollar has increased in value, it takes more foreign currency to get one dollar. The greater expense for American goods has decreased international demand for American goods thereby



decreasing American exports. The exchange rate has also affected the import side of the trade balance. Imports are now less expensive for Americans because they can get more foreign currency for their dollar. Thus, Americans buy more foreign goods and increase imports. One



can conclude that the appreciating dollar has had a largely negative effect on the trade balance because it aided in both increasing imports and decreasing exports. Again, in considering our forecast, we expect that the American dollar will continue to appreciate in international money markets therefore we can expect this to have a positive affect on imports and a negative effect on exports and a negative overall affect on the trade balance for 2002 and 2003.

### GROSS DOMESTIC PRODUCT

Another important consideration in assessing the future of the United States trade balance was the GDP of our major trading partners and our own disposable income, which is directly related to our own GDP. The GDP of our major trading partners plays a large role in determining real exports. As the wealth of our trading partners increases, their demand for goods will also increase. Hence, the demand for American goods will increase therefore increasing the volume of American exports. Through the 1990s a trade-weighted average of the GDPs of our major trading partners has been increasing. This increase in the wealth of these nations has had a positive effect on American exports, and has helped allow for American exports to increase. It was predicted that that the GDP of our major trading partners will continue to increase through 2002 and 2003 and should have a positive effect on real exports.

### DISPOSABLE INCOME

American disposable income, on the other hand, greatly affects the import side of the trade balance. In the same light as GDP, the more Americans have to spend, the more they will demand goods, including foreign imports. Through the 1990s and into this century, the trend in disposable income has been upward. These increases in disposable income have had a positive effect on imports, but have also added to a decrease in the overall trade balance.

In 2002, it is predicted that the trade balance is going to continue to decrease. In fact, an 11.23% decrease is predicted for this year. Although this is higher than the 3.67% decrease in 2001, it is not high when compared to the ten-year average of 47%. In fact, this forecast represents an optimistic outlook for the future of the trade balance when compared to the 47% annual decrease. As a continuation of this trend, the trade balance is predicted to decrease in 2003 as well, by 12.61%. These decreases can be viewed on the graph of the US Trade Balance. The shaded area represents the forecasted values in 2002 and 2003; the

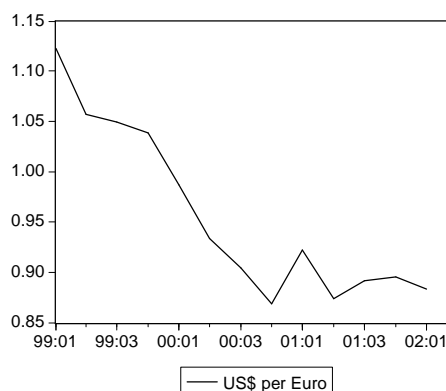
continued decrease in the trade balance can be clearly visible. It can be concluded that although the GNP of our major trading partners is expected to increase, which would help increase the trade balance, this is not enough to offset the appreciating dollar and our own increasing disposable income. Both of these variables will play a role in decreasing the trade balance through 2003.

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## GOING ALL EURO

BY ISIL MUDERRISOGLU & AMJAD TUFFAHA

On January 1<sup>st</sup> 2002, the Euro was placed into circulation in 12 member countries of the European union, signaling a big step in the process of economic integration in Europe. The transition to the Euro is expected to be complete by now, with all domestic currencies almost out of circulation.



Since its introduction in 1999 as part of the European monetary integration, the Euro witnessed a continuous depreciation resulting in a 12% decrease in the value of the currency against the US dollar since its inception. This depreciation has been largely due to the flow of over \$450 billion during the last three years by Euro-zone investors on U.S. bonds and equities. But since the end of the year 2000, the economic slow down in the US economy seemed to have caused an improvement in the exchange rate- many European investors were hesitant to invest in an economy just emerging from a recession.

Here, we tried to develop a model that explains variation in the US exchange rate against the Euro in terms of the US trade balance, the interest rate differential, and the US consumer price index in comparison to that in the Euro zone. According the economic theory, the two

main determinants of exchange rates are the interest parity and the purchasing power parity.

Interest parity refers to the effect of transactions in financial markets on exchange rates, which comes about from changes in the differential between foreign and domestic rates. For example, an increase in the US interest rate on some asset (i.e. US treasury bonds) in comparison to a European interest rate on a corresponding asset, results in a prospective gain from holding more US bonds, which results in an increased demand for US dollars and an appreciation in the dollar. Conversely, a fall in the differential results in a gain from holding more foreign bonds and an increased demand for foreign bonds and hence currency, resulting in a depreciation of the US dollar.

Purchasing power parity refers to the effect of transactions in the goods market (i.e. exports and imports) on exchange rates. A higher trade balance implies more exports relative to imports, resulting in more demand for US dollars relative to the demand for Euro, and hence an appreciation of the dollar.

The effect price changes have on exchange rates could go in either way depending on price elasticity. Higher domestic price level relative to the Euro-zone price level would immediately cause exports to rise in nominal terms relative to imports, and thus causes the dollar to depreciate. In the long run, as the markets adjust for the price change, the demand for exports will fall relative to imports, and depending on elasticity, this might or might not offset the initial increase in the dollar amount of exports.

The model we developed takes these three factors as explanatory variables and employs quarterly data since the launch of the Euro in 1999. This model seemed to provide a good fit for the US-Euro exchange rate, as it explained 98% of the variation. However, the signs on the coefficients did not match the predictions of economic theory on interest and purchasing parity.

Surprisingly, we found the model predictive ability to be quite high when performing an ex-post forecast of the exchange rate. The model's predictions were only 1.9% off the actual values for past data. In light of this, we used the model to obtain a quarterly forecast of the exchange rate starting with the second quarter of 2002 through the end of 2003. Based on this model, we expect the dollar to steadily depreciate against the Euro and reach a rate close to 1 US dollar per Euro by the end of 2003.

This forecast seems to be consistent with the current trend in the exchange rate, and depends on an expected reversal in the trend of the US trade balance,

which has been declining steadily over the last ten years. The forecast also depends on forecasted stable inflation rates over the next two years.

The success or failure of the Euro, according to the observers, is no longer tied to its exchange rate versus the dollar, but rather depends on its ability to bring about more trade and economic prosperity for the participating countries. The next two years will be the real test for the Euro, and will determine whether more EU countries, most notably the skeptical British, will decide to join in.

