The Euro:

Determinants of Public Opinion

by

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Abstract

Despite consistent progress toward common policies and institutions, relatively short-term economic performance indicators have had a significant impact on the popularity of the common European currency, the euro. Using economic and public opinion data from current European Union (EU) member countries, ranging from 1990-2003, I have found that the most important determinants of future support for the euro have been differences in inflation, GDP growth, and unemployment rates between domestic economies and EU averages. Applying these findings to the recent economic performance of the 10 EU acceding countries, one could have predicted the recent collapse in public support of the euro in those countries. A further implication of these findings, and a possible avenue for further research, would be to assess the hypothesis that superior economic performance (relative to EU countries) and increased compliance with the EMU convergence criteria may actually have the perverse effect of decreasing public support for the euro in EU acceding countries.

Introduction

The use of a common European currency continues to be an issue on which not all countries agree. Although 12 European Union (EU) member countries have adopted a single currency, the euro, three EU member countries have resisted membership in this European Monetary Union (EMU), despite their willingness to participate in other forms of economic and political integration. Opposition to the euro continues to run strong in these countries, two of which (Sweden and Denmark) have recently rejected schemes to adopt the currency in popular referenda. Due to the expansion of the European Union into Eastern Europe later this year, more countries may soon be joining the EMU. An important issue for policy makers in these so-called "acceding countries" is how their countries', and indeed the European continent's, economic performance might affect popular support for joining the common currency.

European Economic Integration

Historical Background

Modern European economic integration began to accelerate in the 1950's when Belgium, France, Germany, Italy, Luxemburg, and the Netherlands ratified several new treaties outlining common economic policies and procedures. Specifically, in 1951 these six countries combined their coal and steel resources, establishing the European Coal and Steel Community. Six years later, the "Treaties of Rome" created the European Atomic Energy Community and the European Economic Community (EEC), the latter being solely responsible for negotiating customs duties, implementing safeguard and anti-

dumping measures, and legislating rules for public procurement. These three institutions formed the basis of the European Community (EC), the precursor of today's European Union. By 1968, customs duties and quantitative trade limits were abandoned in intra-EEC trade; a common external tariff was introduced in place of the national customs duties, to be applied in trade with the rest of the world[1].

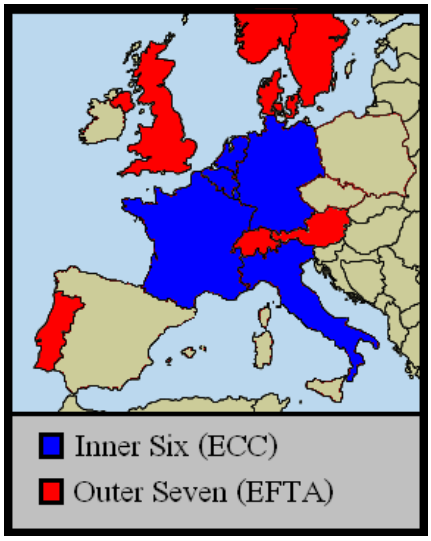

Figure 1: ECC and EFTA expand European economic integration.

Another entity promoting European economic integration, the European Free Trade Association (EFTA), was established in 1960 by Austria, Denmark, the United Kingdom, Norway, Portugal, Sweden, and Switzerland. As opposed to the so called "inner six" countries of the EEC, EFTA countries came to be known as the "outer seven." EFTA began with two goals: 1) to establish free trade amongst its members and 2) to

[1] For more information about the EEC, please see the Columbia Encyclopedia (Sixth Edition), under "European Economic Community."

seek a broader economic union with the rest of Europe[2]. The "outer seven" largely met their first goal by 1966, when most intra-EFTA tariffs were abolished. Progress toward the group's second goal was hastened by the United Kingdom in 1961, when that country began to pursue membership in the EEC. Although France vetoed the United Kingdom's first attempt to join the EEC, later discussions succeeded in having both the UK and Denmark admitted as new members in 1973, at which point they left EFTA.

With this shift in membership came a newly negotiated trade accord between the expanded EEC and the remaining EFTA members. The development of a single market between the EEC and EFTA was essentially completed in 1994, when the European Economic Area (EEA) came into being, consisting of most of the previous EEC/EFTA member countries. The agreement leading to the EEA was principally motivated by "four freedoms," including: 1) freedom of movement of goods, 2) freedom of movement of persons, 3) freedom of services, and 4) freedom of capital[3].

Progress Toward a Common Currency

As early as 1971 the European Community Council endorsed a three-stage plan for the implementation of monetary union by the end of the decade, however this course of action lost steam and was abandoned within a few years. Not to be deterred, with the implementation of the European Monetary System (EMS) in 1979, the EEC pursued its objective of creating a zone of currency stability. Indeed, member states agreed to an exchange rate mechanism designed to maintain their exchange rates within certain

[2] For more information about EFTA, please see the Columbia Encyclopedia (Sixth Edition), under "European Free Trade Aggreement."
[3] For more information about the EEA, please see the European Union website's "External Relations" page at http://europa.eu.int/comm/external_relations/eea/

fluctuation margins[4]. It was within this context that the European Currency Unit (ECU), the precursor to the euro, was born. However by the early 1990's the European Monetary System was strained by the differing economic policies and conditions of its members, especially a newly reunified Germany. The United Kingdom permanently withdrew from the system following the now infamous speculative attack on the sterling successfully launched by George Soros in 1992[5].

The most definitive step toward a common European currency came in 1991, with the signing of the "Maastricht Treaty on European Union." *Maastricht* is the best known and probably the most controversial of modern European treaties. Its infamy stems not only from the long and contentious negotiations that lead to its drafting, but also its "baffling terminology" and the subsequent difficulties many member states encountered in ratifying it[6]. By adding two new areas of common policy – "justice and home affairs" and a "common foreign and security policy" – to the existing European Community, the "three pillars" of the European Union were established.

In addition to pursuing these new policies and extending official European citizenship to the citizens of the 12 original member states, *Maastricht* became the blueprint for establishing the European Monetary Union, setting out the three stages of progress which would eventually lead to a common currency. Additionally, *Maastricht* delineated the important "convergence criteria" (economic tests, if you prefer) that

[4] For more information about the exchange rate mechanism (ERM), please see the *BBC*'s "Euro-Glossary" at http://news.bbc.co.uk/2/hi/in_depth/europe/euro-glossary/1216833.stm
[5] For more information about the fall of the sterling, please see "Big Winner from Plunge in Sterling," printed in *The New York Times*; October 29, 1992.
[6] For more information about *Maastricht*, please see the EU's website at http://europa.eu.int/en/record/mt/top.html

member states would have to pass in order to join the EMU[7]. As a complement to and specification of the convergence criteria laid out at *Maastricht*, the European Council also adopted the "Stability and Growth Pact," which aimed to ensure budgetary discipline with respect to EMU countries, in 1997.

Maastricht further provided for the founding of the European Monetary Institute (EMI), an organization established exclusively for the purpose of preparing Europe for economic and monetary integration. The EMI's two primary charges were[8]:

> "i. to strengthen central bank co-operation and monetary policy coordination; and
>
> ii. to make the preparations required for the establishment of the European System of Central Banks (ESCB), for the conduct of the single monetary policy and for the creation of a single currency in the third stage of monetary union."

In fulfilling the above responsibilities, the EMI relied on members of the central banks of all 15 EU countries. In 1996, the EMI presented a report to the EC, which formed the basis of the principles and fundamental elements of the new exchange rate mechanism, which was adopted in June 1997. At the same time, the EMI presented the EC with the selected design series for the euro banknotes to be circulated on January 1, 2002.

In May 1998 the European Council unanimously decided that 11 member states (Belgium, Germany, Spain, France, Ireland, Italy, Luxembourg, the Netherlands, Austria, Portugal, and Finland) had fulfilled the economic conditions necessary for the adoption

[7] There are five essential convergence criteria for joining the EMU: 1) Budget deficit must be less than 3% of GDP, 2) Public debt must be less than 60% of GDP, 3) Countries must have an inflation rate within 1.5% of the three EU countries with the lowest rate, 4) Long-term interest rates must be within 2% of the three lowest rates in EU, and 5) Exchange rates must be kept within "normal" fluctuation margins of Europe's exchange-rate mechanism.

[8] For more information about the EMI, please see the ECB's website at http://www.ecb.int/emi/about/about01.htm

of the single currency on January 1, 1999[9]. Within a month, the governments of the 11 participating member states appointed the President, Vice-President and four other members of the Executive Board of the European Central Bank (ECB). These appointments became effective on June 1, 1998, marking the establishment of the ECB. The national central banks of the participating member states along with the ECB constitute the "Eurosystem," which formulates and defines the single monetary policy called for in the third stage of EMU. Having completed its two primary tasks, the EMI was liquidated upon the establishment of the ECB. On January 1, 1999, the third and final stage of EMU commenced with the fixing of the exchange rates of the 11 member states' currencies and the formulation of a single monetary policy under the responsibility of the ECB.

On the Outside Looking In

The astute reader will have noted by now that 15 EU countries minus 12 EMU countries equals three countries in a state of limbo (Denmark, the United Kingdom, and Sweden), having not committed to the common currency despite their desire to engage in other common European political and economic policies. Although the successful implementation of the euro in 2002 did have a positive effect on sentiment toward the euro in these three countries, the question of whether they will eventually join the EMU is still in doubt. The so-called "EU3" countries have so far managed to stay outside the EMU without experiencing large disadvantages. However, they do not enjoy the supposed benefits of EMU membership such as the fostering of trade and investment brought about by the elimination of exchange-rate risks with EMU partner countries, the reduction of transaction costs and participation in a large and liquid financial market.

[9] The twelfth and most recent country to join the EMU was Greece, doing so on January 1, 2001.

In order to join the EMU, these three countries must fulfill the same convergence criteria as the 12 EMU member states. In reality, however, meeting the convergence criteria does not pose a serious threat to membership. Denmark actually currently fulfils all the *Maastricht* criteria, but has already once rejected joining the EMU in a popular referendum held in 2000. The two impediments for the UK and Sweden are 1) the exchange rate criterion, which requires smooth participation in the new exchange rate mechanism for at least two years, and 2) lagging public support for the euro.

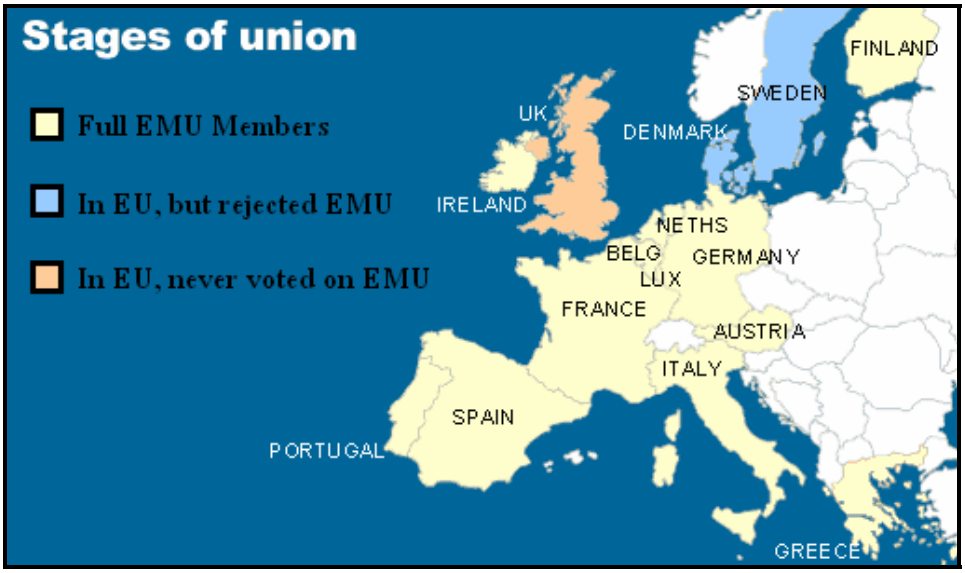

Figure 2: Europe's different stages of political and economic integration

Swedish non-participation in the exchange rate mechanism is based on a deliberate policy by Swedish political authorities to not meet the convergence criteria, since meeting them would actually require Sweden to join the EMU[10]. The Swedes have explicitly expressed their determination to hold out for popular approval of the euro by

[10] Sweden, unlike Denmark and the United Kingdom, did not negotiate an "opt-out" clause. Technically, Sweden must join the EMU when they meet the convergence criteria outlined at *Maastricht*.

way of national referendum before complying with the exchange rate mechanism. In September 2003, Swedish voters rejected EMU membership in the country's first such referendum (56% against membership, 42% in favor). The United Kingdom has never held a referendum on EMU membership; however the issue is a fractious and hotly debated one in the country. Chancellor of the Exchequer, Sir Gordon Brown, has outlined a series of "five tests" he believes the UK's economy must meet before voting on EMU membership[11].

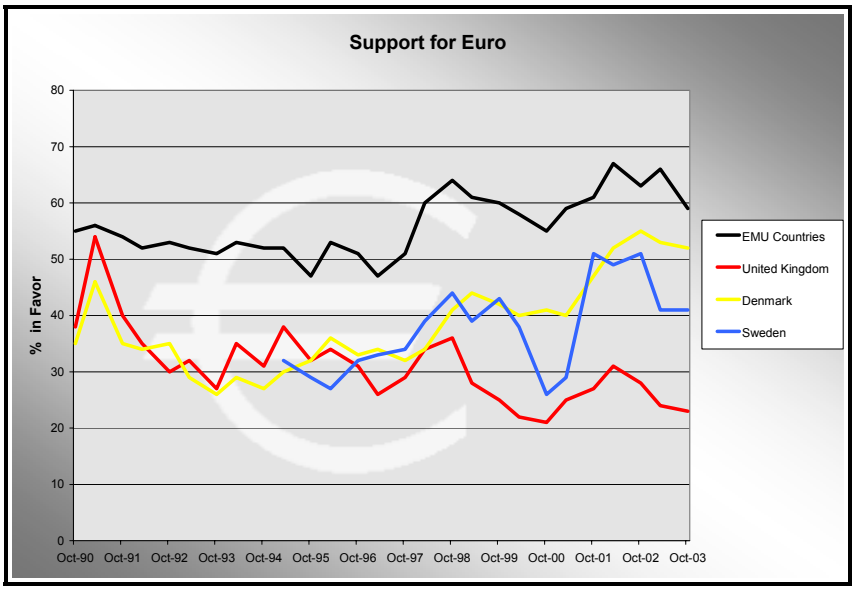

Figure 3: Support for the euro is weaker in the United Kingdom, Sweden, and Denmark.

European Union Acceding Countries

The European Union is currently preparing for its most substantial enlargement ever in terms of scope and diversity. Specifically, 13 countries have applied to become

[11] Briefly, the five tests are: 1) Would joining the EMU create better conditions for firms making long-term decisions to invest in the UK? 2) How would adopting the single currency affect the UK's financial services? 3) Are business cycles and economic structures compatible so that the UK and others in Europe could live comfortably with euro interest rates on a permanent basis? 4) If problems emerge, is there sufficient flexibility to deal with them? and 5) Will joining the EMU help to promote higher growth, stability and a lasting increase in jobs?

new EU members. Ten of these countries (Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, the Slovak Republic, and Slovenia) are set to join on May 1, 2004. They are currently known by the term "acceding countries." In their negotiations with the EU Council, the acceding countries have agreed to fulfill the economic and political conditions known as the "Copenhagen criteria," according to which a prospective member must[12]:

1) "be a stable democracy, respecting human rights, the rule of law, and the protection of minorities;
2) have a functioning market economy;
3) adopt the common rules, standards and policies that make up the body of EU law."

The EU has assisted these countries in adopting EU laws, simultaneously providing financial assistance to improve their infrastructure and economy. Also, as part of the negotiation process, each of the acceding countries has agreed to join the EMU when they have proven capable of meeting the convergence criteria which all other EMU member states have fulfilled.

Methodology

Having reviewed the recent history of Europe's economic and monetary integration and surveyed the landscape of the EMU's potential expansion into Eastern Europe, I will now address the central question of the paper: *How do economic indicators impact public support for the euro in European Union countries?* In answering this question, I will rely on survey information provided by the European Union, as well as economic performance measures from sources such as the International Monetary Fund

[12] For more information please see the European Union's website at http://europa.eu.int/comm/enlargement/intro/criteria.htm

and Eurostat. Using both single and multi-variable analyses, I will demonstrate that differences between inflation, unemployment, and GDP growth rates factor prominently in future public support of the euro. Lastly, I will apply my findings to the case of the ten EU acceding countries to see if I could have predicted the recent decline in public support of the euro in those countries.

Public Opinion Data Overview

My analysis of public support of the euro relies on two types of data: public opinion polling data and economic performance measures. I will first discuss the public opinion data relied upon in my assessment, since this is my response variable and the measure I hope to be able to predict at the conclusion of the analysis. The sole source of public opinion data in this analysis is the *Eurobarometer* series, a semi-annual publication produced by the European Commission. *Eurobarometer* surveys have been conducted since 1973, consisting of results from sit-down interviews with at least 1,000 people in each member state, except Luxemburg where only 600 interviews are conducted. The surveys contain information about public sentiment toward domestic and European institutions, expectations concerning future political arrangements and economic performance, as well as timely reports on "issues of the day," such as geopolitical developments and/or conflicts around the globe[13].

Since 1990, *Eurobarometer* interviews have consistently included questions regarding public support for a single European currency. Before *Maastricht* the question regarding common currency read:

[13] For more information about the *Eurobarometer* series, please see the EU's website at http://europa.eu.int/comm/public_opinion/

"The Council of Heads of State and Governments of the European Community has called for intergovernmental conferences to discuss details of a European Economic and Monetary Union and of a Political Union. I am going to read you a number of statements. For each one, please tell me whether you favor, oppose, or have no opinion… Within a European Economic and Monetary Union, a single common currency replacing the different currencies of the Member States."

Shortly after ratification of *Maastricht* in 1991, the question took on a slightly different wording:

"*What is your opinion on the following statement? Please tell me if you are for it, against it, or have no opinion: A European Monetary Union with one single currency; the Euro."*

Although it may be argued that the inconsistent wording of these two questions could lead to inconsistent statistical measurements of public support of the euro over time, I have integrated polling data from both eras in my analysis, since I feel the questions are similar enough as to be comparable.

I must note a subtle, though important, adjustment made to the measure of public support for the euro used in my analysis. Consider the following potential polling data from different time periods: $t = 1$ and $t = 2$.

Time Period	Favor	No Opinion	Oppose	Favor - Oppose
t=1	50%	0%	50%	0%
t=2	50%	25%	25%	25%

What is the "best" way to measure public support for the euro in these two periods? If I use only the percent in favor of the euro, then the reading for public support is 50% in both time periods. However, in period $t = 2$, 25% fewer people oppose the euro than in

period $t = 1$. Clearly, an adjustment should be made to account for this migration into the "No Opinion" response group. I have elected to make this adjustment by using the difference between the percent in favor of the euro and the percent opposed to the euro in a given time period as the best measure for public support; this measure is henceforth referred to as "Net Public Support" (NPS):

$$\boldsymbol{NPS_{s,t}} = \%\ \text{Favor}_{s,t} - \%\ \text{Oppose}_{s,t} \text{ for country } s, \text{ at time period } t$$

From past *Eurobarometer* reports I have accumulated 27 semi-annual NPS observations for each of 12 EU countries, ranging from 1990-2003. For the other three EU countries (Sweden, Austria, and Finland) I have accumulated 18 semi-annual NPS observations, ranging from 1995-2003.

Before proceeding to detail the economic data utilized in my analysis, I should take a moment to describe some trends in NPS for the euro across countries and over time in the European Union. First, it is interesting to note that most EU countries have tended to support the euro over the 14-year polling period (please see Appendix 1 for a table of country abbreviations):

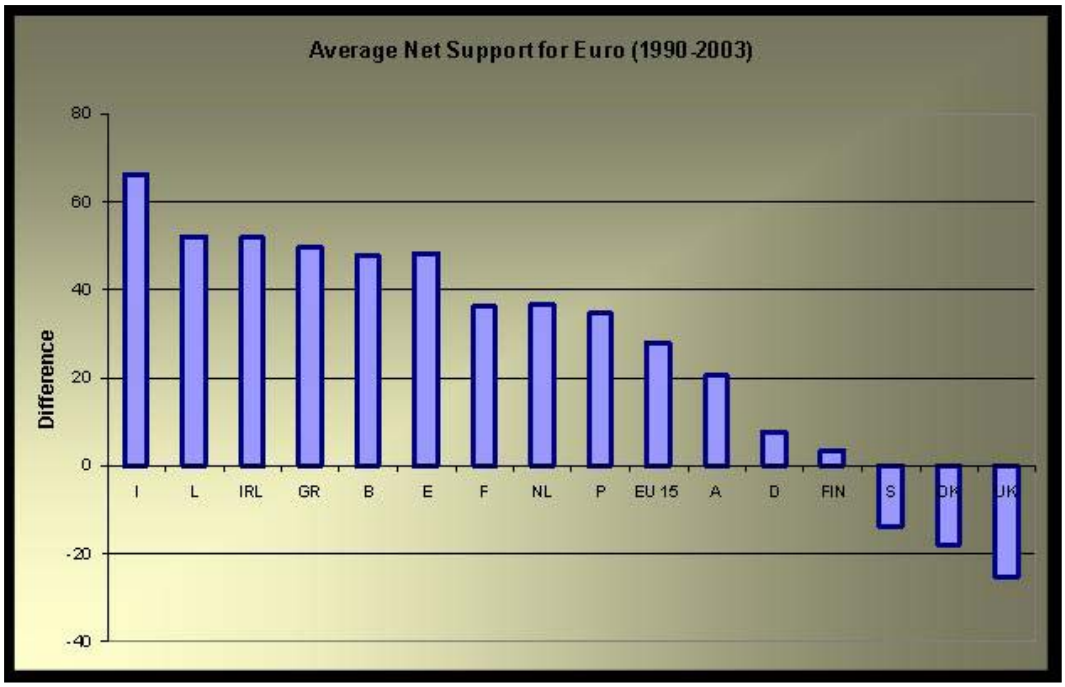

Figure 4: NPS for the euro in the European Union

Not surprisingly, Sweden, Denmark and the United Kingdom, the so called EU3 countries, are the only countries to show negative average NPS over the polling period. Germany and Finland have demonstrated ambivalent support for the euro over time, while all other countries have shown strong NPS for the single currency (on average). Over the polling period, these countries experienced four different trends in NPS: volatile upward, volatile downward, volatile, and steady holding.

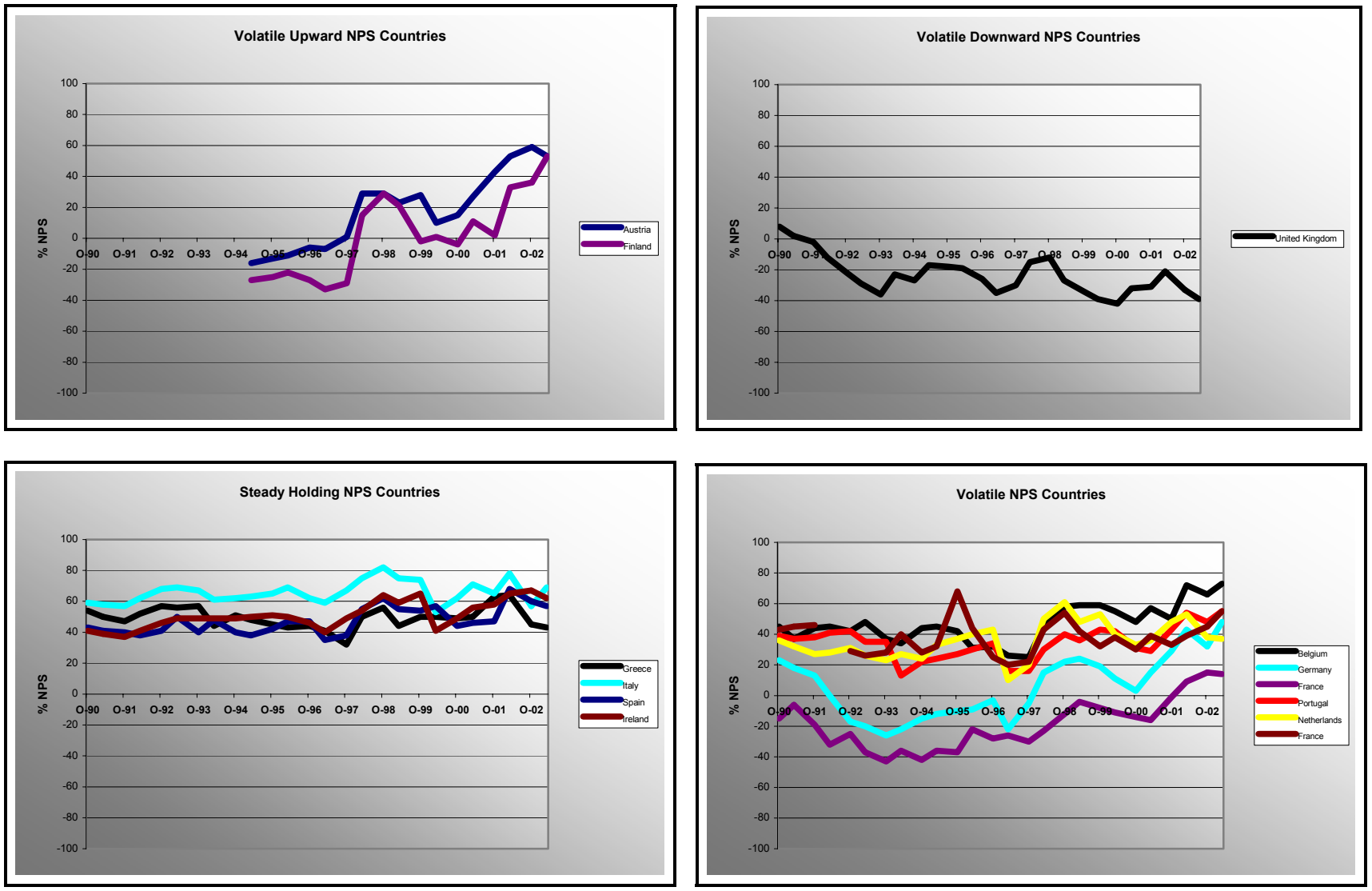

Figure 5: Steady Upward, Steady Downward, Steady Holding, and Volatile Trend NPS Countries

It is worth noting that the countries included in my analysis have demonstrated different trends in and average levels of NPS over time. Moreover, NPS across the European Union as a whole has been fairly volatile, twice trending downward and rebounding upwards:

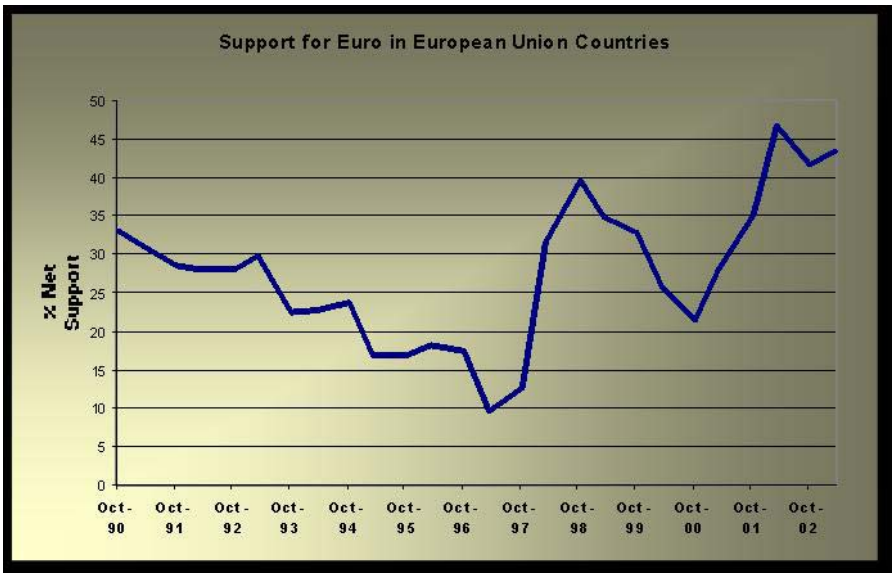

Figure 6: NPS of the euro in the European Union (1990-2003)

This diversity of public support makes me more confident in applying the results and implications of my analysis to other countries, about which I may have little information concerning previous trends in public opinion regarding the euro.

Economic Performance Data Overview

Since the goal of my analysis is to determine the direction and extent of impact of economic performance indicators on NPS of the euro, it is important to be explicit about which indicators are being used, how they are being defined, and who is responsible for their measurement. I initially included over 30 different performance indicators in my analysis, however many of these variables proved to have no significant impact on public

opinion. For a full table of the indicators tested, please see Appendix 2. Here I will limit the discussion to those variables which proved significant in explaining NPS of the euro:

Gross Domestic Product (GDP) Growth: As a measure of GDP growth, I elected to use year-over-year (YoY) growth in real GDP at constant 1995 prices, computed by Eurostat for all 15 EU countries.

Let: $\boldsymbol{GDPDIF_{s,t}} = Gr(GDP)_{s,t} - Gr(EGDP)_t$ for country *s* at time *t*

Where: $\boldsymbol{Gr(GDP)_{s,t}}$ = YoY Real GDP growth for country *s* at time *t*

$\boldsymbol{Gr(EGDP)_t}$ = YoY Real GDP growth for the EU at time *t*

Inflation Growth: As a measure of inflation, I elected to use YoY growth in Eurostat's Harmonized Index of Consumer Prices (HICP), computed for all 15 EU countries.

Let: $\boldsymbol{HICPDIF_{s,t}} = Gr(HICP)_{s,t} - Gr(EHICP)_t$ for country *s* at time *t*

Where: $\boldsymbol{Gr(HICP)_{s,t}}$ = YoY HICP growth for country *s* at time *t*

$\boldsymbol{Gr(EHICP)_t}$ = YoY HICP growth for the EU at time *t*

Unemployment Rate: As a measure of unemployment rates, I elected to use Eurostat's Harmonized Unemployment Rates, computed for all 15 EU countries.

Let: $\boldsymbol{UEDIF_{s,t}} = UE_{s,t} - EUE_t$ for country *s* at time *t*

Where: $\boldsymbol{UE_{s,t}}$ = Harmonized Unemployment Rate for country *s* at time *t*

$\boldsymbol{EUE_t}$ = Harmonized Unemployment Rate for the EU at time *t*

Exports/Imports: To describe a given country's trade openness as well as their trade surplus/deficit, I elected to use data from Eurostat concerning the value of exports and imports of goods and services, measured in euros. Dividing by the level of GDP in that country makes these observations comparable across countries and time.

Let: $\boldsymbol{TRDSRP_{s,t}} = (X\text{-}M)_{s,t} / GDP_{s,t}$ = Trade surplus for country *s* at time *t*

$\boldsymbol{OPEN_{s,t}} = (X+M)_{s,t} / GDP_{s,t}$ = Trade openness for country *s* at time *t*

Where: $\boldsymbol{X}$ = Value of Exports (goods and services)

$\boldsymbol{M}$ = Value of Imports (goods and services)

$\boldsymbol{GDP}$ = Value of Gross Domestic Product (same units as X and M)

Single-Variable Correlation with NPS

So what can one say about the relationship between NPS of the euro and the economic performance indicators described above? In order to get some idea of what variables might have the most significant impact on support for the euro, I first computed the correlation between NPS and each of the respective economic indicators included in my analysis, lagged by one quarter:

Correlation ($\boldsymbol{NPS_{s,t}}$ **,** $\boldsymbol{Indicator_{s,t-.5}}$ **)** for country *s*, at time *t* (half-years)

Figure 7 below presents those economic indicators demonstrating statistically significant correlations with net public support of the euro. The results of this preliminary test are not surprising. Countries experiencing higher inflation rates than the rest of the EU tended to support implementation of the euro, as did countries with higher unemployment rates. Also, countries that tended to export more than they imported were more likely to support the implementation of the euro. High EU unemployment rates were negatively

correlated with the popularity of the single currency. Taken by themselves, however, none of these variables could explain more than 10% of the variation in countries' support for the euro. Is it possible to attain more explanatory results while maintaining the intuitive appeal of the simple correlations previously described by using a multi-variable analysis?

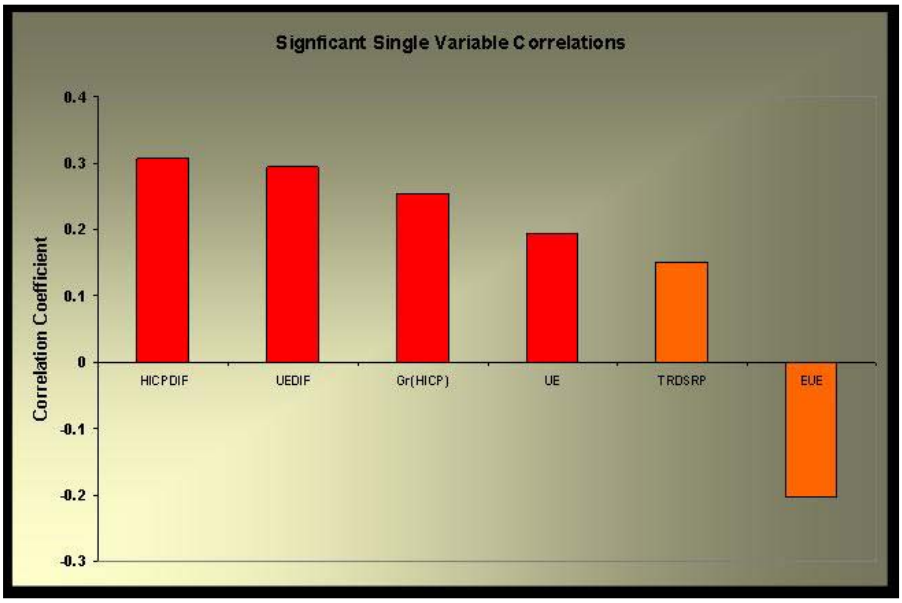

Figure 7: Correlation with NPS (Red: 99% Significant, Orange: 95% Significant)

Proposed Multi-Variable Regression: The Basic Model

In constructing a simple multi-variable model to test for the impact of economic performance indicators on NPS of the euro, I incorporated information concerning the average performance of European Union countries, as well as differences between these averages and domestic performance in the respective EU countries. Specifically, the first model tested in my analysis is a straightforward multi-variable regression with the following form:

$$\boldsymbol{NPS_{s,t}} = \beta_0 + \beta_1 * Gr(EGDP)_{t-.5} + \beta_2 * GDPDIF_{s,t-.5} + \beta_3 * Gr(EHICP)_{t-.5} + \beta_4 * HICPDIF_{s,t-.5} + \beta_5 * EUE_{t-.5} + \beta_6 * UEDIF_{s,t-.5} + \beta_7 * OPEN_{s,t-.5} + \beta_8 * TRDSRP_{s,t-.5}$$ for country s, at time t (half-years)

Figure 8 below outlines my expectations and rationale for the *ceteris paribus* directional impacts of the various β coefficients in the above "basic model":

Coefficient	Acts On	Expected Direction	Rationale
β_1	$Gr(EGDP)_{t-.5}$	Positive	NPS of euro increases with European GDP growth
β_2	$GDPDIF_{s,t-.5}$	Negative	NPS of euro decreases when domestic country grows faster than Europe
β_3	$Gr(EHICP)_{t-.5}$	Negative	NPS of euro decreases with European inflation growth
β_4	$HICPDIF_{s,t-.5}$	Positive	NPS of euro increases when domestic inflation is greater than European inflation
β_5	$EUE_{t-.5}$	Negative	NPS of euro decreases with growth in European unemployment rate
β_6	$UEDIF_{s,t-.5}$	Positive	NPS of euro increases when domestic UE is worse than European UE
β_7	$OPEN_{s,t-.5}$	Positive	NPS of euro increases with countries' trade openness
β_8	$TRDSRP_{s,t-.5}$	Positive	NPS of euro increases with extent of countries' trade surplus

Figure 8: Expectations for "Basic Model"

In testing the viability of the proposed relationships, I utilized data from 14 of the 15 European Union countries. I could not include Luxemburg in this analysis due to its lack of economic performance indicators. I tested the proposed basic model on the following three groupings of EU countries:

EU14	**EMU**	**EU3**
Austria	Austria	Denmark
Belgium	Belgium	Sweden
Denmark	Italy	United Kingdom
Italy	Germany	
Germany	Portugal	
Sweden	Ireland	
United Kingdom	France	
Portugal	Netherlands	
Ireland	Greece	
France	Finland	
Netherlands	Spain	
Greece		
Finland		
Spain		

Figure 9: Country Groupings for data analysis

Multi-Variable Regression Results: The Basic Model

- EU14

Testing the basic model using data from the 14 European Union countries included in my analysis, I was able to achieve an adjusted-R^2 of .402 and a p-value of .000, meaning this regression was statistically significant and explained roughly 40% of the variation in NPS of the euro. All but one of the model's coefficients had their proposed directional impact; only European GDP growth influenced NPS in an unanticipated direction. The effects of trade openness and trade surplus were

relatively small in comparison to GDP, inflation, and unemployment indicators. The difference between domestic and European inflation had the greatest impact of any of the proposed variables, *ceteris paribus*. Each of the independent variables examined was statistically significant at the 90% level or higher.

Dependent Variable: NPS			
Observations: 237			
Coefficient	**Acting On**	**Value**	**P-Value**
β0	*Constant*	0.7	0.001
β1	*Gr(EGDP)*	-2.9	0.076
β2	*GDPDIF*	-3.7	0.000
β3	*Gr(EHICP)*	-6.6	0.000
β4	*HICPDIF*	9.4	0.000
β5	*EUE*	-3.8	0.025
β6	*UEDIF*	5.5	0.000
β7	*OPEN*	0.3	0.000
β8	*TRDSRP*	0.5	0.000
Regression:			
Adj-RSq:	0.402	**P-Value**	0.000

Figure 10: "Basic Model" results (EU Countries)

In explaining the signs of the coefficients in these regressions, it is important to keep in mind that co-linearity between the independent variables may convolute my interpretation of their directional impact. Appendix 3 presents the correlation coefficients between the economic indicators used in this and all further regressions.

- *EMU*

The results of the analysis carried out exclusively on EMU member countries are similar to the results obtained when all EU countries are included. Since only Denmark, Sweden, and the United Kingdom have been removed from the initial

analysis, this is not surprising. Once again, the difference between domestic and European inflation has the greatest impact on NPS, while European GDP growth is associated with a decline in public support for the euro, *ceteris paribus*. Also, the impacts of trade openness and surplus continued to be relatively small, however trade openness was associated with a decline in NPS in this regression, *ceteris paribus*. As before, all independent variables proved to be significant at the 90% level or higher. When only EMU countries' data are included, the regression's adjusted-R^2 dips to .317, however its p-value is still statistically significant.

Dependent Variable: NPS			
Observations: 183			
Coefficient	**Acting On**	**Value**	**P-Value**
β0	*Constant*	0.9	0.000
β1	*Gr(EGDP)*	-2.6	0.080
β2	*GDPDIF*	-2.0	0.006
β3	*Gr(EHICP)*	-4.5	0.004
β4	*HICPDIF*	5.4	0.000
β5	*EUE*	-5.2	0.001
β6	*UEDIF*	2.4	0.000
β7	*OPEN*	0.3	0.000
β8	*TRDSRP*	-0.4	0.015
Regression:			
Adj-RSq:	0.317	**P-Value**	0.000

Figure 11: "Basic Model" results (EMU Countries)

- *EU3*

Lastly, when applying the basic model to data exclusively from EU3 countries, the regression is still statistically significant with an adjusted-R^2 of .377. In this application, however, the impacts of the various economic indicators are not as clear-

cut. Only three of the eight indicators' coefficients are significant at the 90% level or higher. Of those, two are trade openness and surplus, which have a comparatively small impact on NPS. Relatively high co-linearity between the economic indicators in these three countries may explain the unanticipated directional effects and statistical insignificance of some of the coefficients in this regression compared to others.

Dependent Variable: NPS			
Observations: 58			
Coefficient	**Acting On**	**Value**	**P-Value**
β0	*Constant*	-0.8	0.018
β1	*Gr(EGDP)*	-2.2	0.283
β2	*GDPDIF*	-3.5	0.023
β3	*Gr(EHICP)*	-2.5	0.210
β4	*HICPDIF*	3.2	0.125
β5	*EUE*	2.3	0.295
β6	*UEDIF*	0.6	0.769
β7	*OPEN*	0.7	0.001
β8	*TRDSRP*	0.8	0.014
Regression:			
Adj-RSq:	0.377	**P-Value**	0.000

Figure 12: "Basic Model" results (EU3 Countries)

Proposed Multi-Variable Regression: The Best Models

After testing my basic model, I asked the question, "Could I increase the explanatory value of these regressions by omitting some variables and incorporating others?" I used statistical software to analyze my data set, trying to achieve the best possible regression in terms of adjusted-R^2 and significance of independence variables. Here is what I found:

- *EU14*

The best model I was able to achieve, using my complete data set of economic performance indicators was quite similar to the basic model I proposed. The difference between domestic and European GDP growth was negatively correlated with NPS of the euro, *ceteris paribus*, while the difference between unemployment rates had a positive coefficient. Differences between inflation in the domestic country and the rest of Europe still had the greatest impact on support for the euro. Interestingly, real wages growth, a newly introduced variable, was associated with a decline in NPS of the euro, *ceteris paribus*. The regression as a whole was statistically significant, as was each of the explanatory variables, reaching an adjusted-R^2 of .516.

Dependent Variable: NPS 237 Semi-Annual Observations		
Predictor	**Coefficient**	**P-Value**
Constant	0.21	0.000
GDPDIF	-1.75	0.026
HICPDIF	11.44	0.000
UEDIF	6.66	0.000
RWAGE	-7.00	0.000
TRDSRP	0.38	0.000
OPEN	0.64	0.000
	Adj. R-Sq	**P-Value**
Regression	51.6%	0.000

Figure 13: "Best Model" results (EU Countries)

Real Wages Growth: As a measure of real wages growth, I elected to use YoY growth in real monthly wages, as measured by the IMF for all EU countries, except Luxemburg.

Let: $Gr(RWAGE)_{s,t}$ = YoY real wages growth in country *s* at time *t*.

- *EMU*

The best possible regression for data exclusively from EMU member countries is very similar to the best regression for all EU member countries presented above. Trade openness, however, does not increase the explanatory value of the regression when only EMU countries are included in the analysis. Otherwise, the directional impact of each of the coefficients is the same as in the above regression. The adjusted-R^2 of .322 is only slightly higher than the adjusted-R^2 of .317 achieved using the "basic model" for EMU countries, however in this case each respective variable included in the analysis has a lower p-value.

Dependent Variable: NPS
149 Semi-Annual Observations

Predictor	Coefficient	P-Value
Constant	0.24	0.000
GDPDIF	-1.20	0.121
HICPDIF	8.28	0.000
UEDIF	3.80	0.000
RWAGE	-4.20	0.001
TRDSRP	0.31	0.000
	Adj. R-Sq	**P-Value**
Regression	32.2%	0.000

Figure 14: "Best Model" results (EMU Countries)

- *EU3*

The best regression for EU3 countries was only slightly more explanatory than the "basic model" regression presented in the previous section, however in this case each of the independent variables was statistically significant at the 95% level or higher. Also, they all had an intuitively-appealing impact on NPS of the euro, *ceteris paribus*. Faster GDP growth than Europe was associated with a decline in public support, as was high European inflation. Meanwhile, trade openness and surplus were associated with greater support of the common currency, although their impacts were relatively small compared to the other independent variables.

Dependent Variable: NPS **58 Semi-Annual Observations**		
Predictor	**Coefficient**	**P-Value**
Constant	-0.52	0.000
GDPDIF	-2.28	0.023
Gr(EHICP)	-3.18	0.040
TRDSRP	0.61	0.003
OPEN	0.54	0.000
	Adj. R-Sq	**P-Value**
Regression	0.385	0.000

Figure 15: "Best Model" results (EU3 Countries)

Application of Results

From the preceding regressions it is clear that economic performance indicators have had a statistically significant impact on future NPS of the euro in the fourteen

countries included in the analysis, all of which are members of the European Union. The most powerful factors in explaining levels of NPS were differences in inflation growth, in GDP growth, and in unemployment rates between the domestic economy and the EU averages. Real wages growth in the domestic economy also seems to have a significant impact on support for the common currency. One interesting application of these results would be to apply the models discussed ealier to the case of the ten acceding countries preparing to join the EU and eventually the EMU. Could the framework developed for explaining NPS in the current EU countries be useful for predicting public opinion in soon-to-be member countries?

To begin to answer this question I will apply the basic model and best model regression results discussed above to the relevant economic performance indicators of the ten EU acceding countries: Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia. I have computed the average levels of the relevant economic performance indicators across these countries over the period 2000/Q4-2002/Q3 in order to predict the average level of NPS over the period 2001/Q1-2002/Q4. Due to unavailability of data for some countries, I am unable to extend this analysis beyond 2002 at the time of writing.

Figures 16, 17, and 18 below reveal three clear trends. First of all, the difference between average inflation in the acceding countries and the EU countries shrank substantially over the two year period, as did the difference between average unemployment rates. That said, the acceding countries still had higher levels of inflation and unemployment than the EU. Meanwhile, the difference between acceding countries'

average GDP growth and the EU's average GDP growth grew over the two year period. In fact, growth rates in the acceding countries were greater than EU growth rates in 2002.

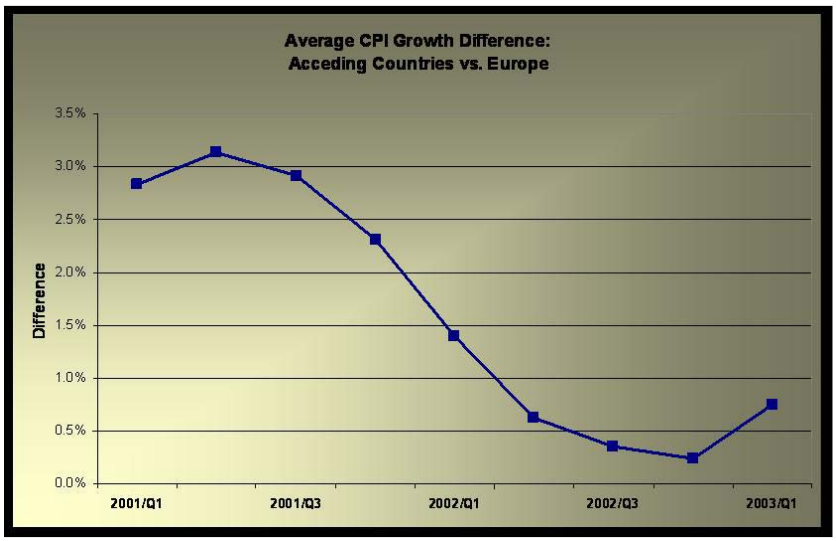

Figure 16: *HICPDIF* decreasing

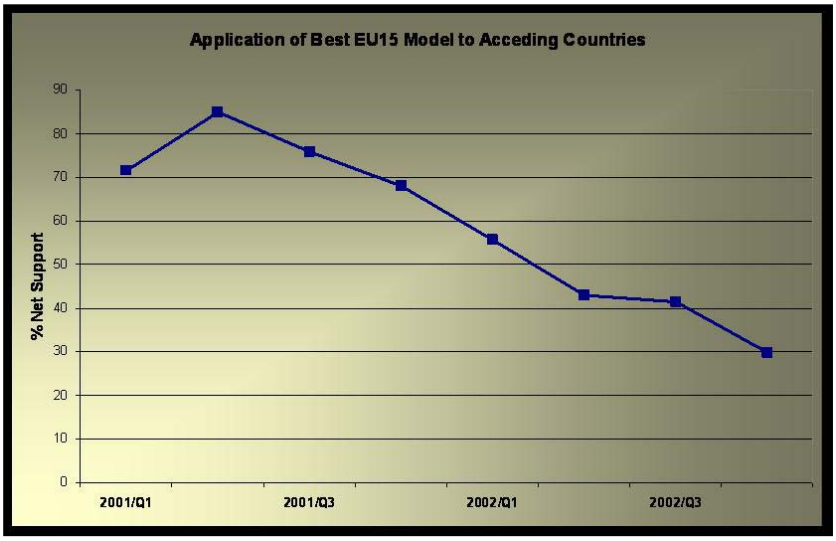

Figure 17: *UEDIF* decreasing

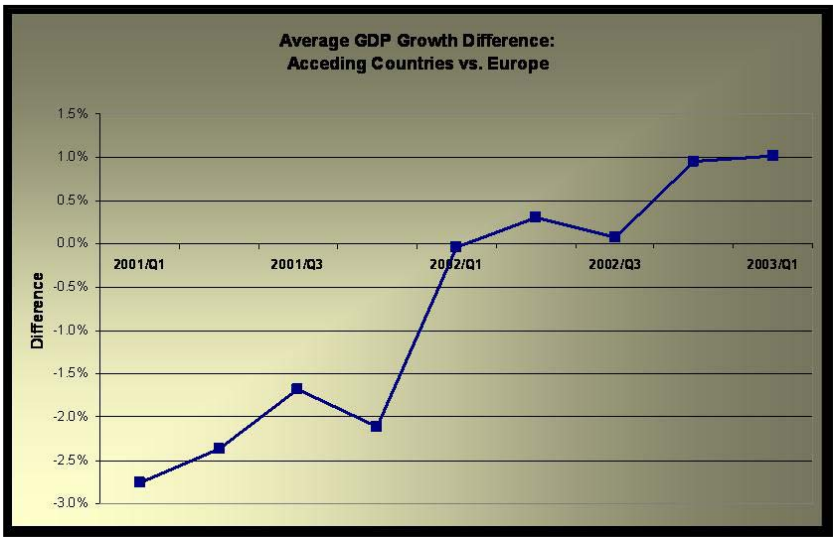

Figure 18: *GDPDIF* increasing

Bringing this data to bear on the models developed earlier, one might expect net public support to be positive, but declining, in the European Union acceding countries:

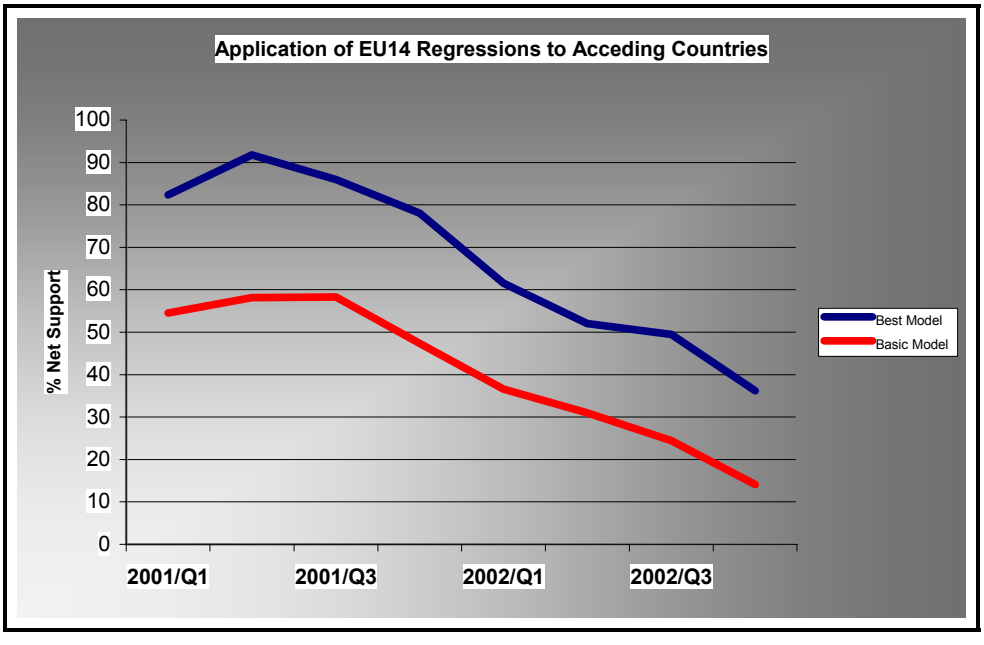

Figure 19: Predicted Net Public Support of Euro in EU Acceding Countries

In fact, this is exactly what has been happening to NPS of the euro in these countries:

"After a period of solid enthusiasm, citizens (of acceding countries) increasingly feel that they will have to pay too expensive a price to join the euro-zone; this feeling might discourage many of those who otherwise supported the idea of the common European currency. In each of the ten acceding countries support for the euro has decreased. However in the acceding countries 58% still support the common currency, while 27% oppose it [NPS = 31%]."[14]

While this sort of anecdotal test certainly does not prove that the relationship identified between NPS of the euro and economic performance indicators may be extended to all EU acceding countries, it is encouraging to note that the model could have helped predict the recent decline in public support of the euro in those countries.

Conclusions

With the expansion of free trade and common markets, European economic integration has progressed steadily over the past 50 years. Cooperation between former European Economic Community and European Free Trade Association members helped create the European Economic Area. Europe is now cohesive as never before with the sharing of common political, economic, and monetary institutions through the European Union. Moreover, European Monetary Union has been implemented successfully in 12 of the 15 EU member states, with exchange rates being locked and new currency floated over the course of the last five years.

Despite this consistent progress toward common policies and institutions, relatively short-term economic performance indicators have had a significant impact on the popularity of the common European currency, the euro. The most important

[14] According to the "First Results" of the 2003 candidate country *Eurobarometer* report. *Eurobarometer* reports for candidate countries are published with less regularity than EU country *Eurobarometer* reports and only began to appear in 2001.

determinants of future support for the euro have been differences in inflation, GDP growth, and unemployment rates between domestic economies and European Union averages. Applying these findings to the recent economic performance of the 10 EU acceding countries, one could have predicted the recent collapse in public support of the euro in those countries. A further implication of these findings, and a possible avenue for further research, would be to assess the hypothesis that superior economic performance (relative to EU countries) and increased compliance with the EMU convergence criteria may actually have the perverse effect of decreasing public support for the euro in EU acceding countries.

Appendix 1: Country Codes

Symbol	Country/Region
A	Austria
B	Belgium
DK	Denmark
FIN	Finland
F	France
D	Germany
GR	Greece
IRL	Ireland
I	Italy
L	Luxemburg
NL	Netherlands
P	Portgual
E	Spain
S	Sweden
UK	United Kingdom
EU	European Union Countries
EMU	European Monetary Union Countries
EU3	EU, but not EMU Countries

Appendix 2: Economic Indicators Analyzed

Economic Indicator	Description	Source
Gross Domestic Product (GDP) GDP Growth Change in GDP Growth	GDP (seasonally-adjusted) in euros at constant prices; YOY growth in such GDP; Change in such growth from previous year	Eurostat
Euro GDP Growth Change in Euro GDP Growth	YOY growth in 15 EU countries' GDP at constant prices; Change in such growth from previous year	Eurostat
GDP Growth Difference Change in GDP Growth Difference	Difference between above rates of GDP growth; Change in such growth from previous year	Calculated
Consumer Price Index (CPI) Growth Change in CPI Growth	YOY growth in respective harmonized consumer price indices; Change in such difference from previous year	Eurostat
Euro CPI Growth Change in Euro CPI Growth	YOY growth in 15 EU Countries' harmonized consumer price index; Change in such growth from previous year	Eurostat
CPI Growth Difference Change in CPI Growth Difference	Difference between above rates of CPI growth; Change in such difference from previous year	Calculated
Unemployment Rate Unemployment Growth Change in Unemployment Growth	Harmonized unemployment rates (not seasonally adjusted); YOY growth in such rates; Change in such growth from previous year	Eurostat
Euro Unemployment Rate Euro Unemployment Growth Change in Euro Unemployment Growth	Harmonized unemployment rate (not seasonally adjusted) for 15 EU countries; YOY growth in such rate; Change in such growth from previous year	Eurostat
Unemployment Rate Difference Growth in Unemployment Difference Change in Growth in Unemployment Difference	Difference between above harmonized unemployment rates; YOY growth of the difference of such rates; Change in such difference from previous year	Calculated
Real Wages Growth Change in Real Wages Growth	YOY growth in real weekly wages; change in such growth from previous year	IMF
Stock Index Growth Change in Stock Index Growth	YOY growth in share price indices; change in such growth from previous year	Eurostat
REER Growth Change in REER Growth	YOY growth in REER; change in such growth from previous year	IMF
Trade Openness Trade Surplus	(Exports + Imports) / GDP (Exports - Imports) / GDP	Eurostat

Appendix 3: Correlation Tables for Independent Variables in Regressions

Table 1: Correlation Coefficients & P-Values; "Basic Model," EU14 Countries

	Gr(EGDP)	*GDPDIF*	*Gr(EHICP)*	*HICPDIF*	*EUE*	*UEDIF*	*OPEN*
GDPDIF	-0.352						
	0.000						
Gr(EHICP)	0.076	-0.317					
	0.181	**0.000**					
HICPDIF	0.007	0.310	0.070				
	0.903	**0.000**	0.211				
EUE	-0.411	0.240	0.057	-0.041			
	0.000	**0.000**	0.338	0.496			
UEDIF	-0.051	0.025	0.115	-0.075	0.066		
	0.401	0.685	0.057	0.214	0.272		
OPEN	0.091	0.117	-0.173	-0.157	-0.226	-0.480	
	0.121	**0.046**	**0.002**	**0.006**	**0.000**	**0.000**	
TRDSRP	0.001	0.035	-0.038	-0.027	-0.034	-0.141	-0.108
	0.991	0.555	0.511	0.642	0.579	**0.022**	**0.047**

Top Number: Correlation Coefficient, **Bottom Number:** P-Value

BOLD: P-Value Significant at 95% level or higher

Table 2: Correlation Coefficients & P-Values; "Basic Model," EMU Countries

	Gr(EGDP)	*GDPDIF*	*Gr(EHICP)*	*HICPDIF*	*EUE*	*UEDIF*	*OPEN*
GDPDIF	-0.308						
	0.000						
Gr(EHICP)	0.076	-0.299					
	0.236	**0.000**					
HICPDIF	-0.002	0.332	0.124				
	0.981	**0.000**	**0.048**				
EUE	-0.411	0.181	0.057	-0.030			
	0.000	**0.009**	0.396	0.660			
UEDIF	-0.034	0.033	0.093	-0.100	0.062		
	0.619	0.637	0.176	0.142	0.362		
OPEN	0.099	0.151	-0.196	-0.135	-0.247	-0.551	
	0.140	**0.024**	**0.002**	**0.039**	**0.000**	**0.000**	
TRDSRP	-0.016	0.050	-0.029	-0.262	-0.030	-0.372	0.605
	0.807	0.461	0.662	**0.000**	0.667	**0.000**	**0.000**

Top Number: Correlation Coefficient, **Bottom Number:** P-Value

BOLD: P-Value Significant at 95% level or higher

Table 3: Correlation Coefficients & P-Values; "Basic Model," EU3 Countries

	Gr(EGDP)	*GDPDIF*	*Gr(EHICP)*	*HICPDIF*	*EUE*	*UEDIF*	*OPEN*
GDPDIF	-0.567						
	0.000						
Gr(EHICP)	0.076	-0.414					
	0.542	**0.001**					
HICPDIF	0.064	0.198	-0.263				
	0.612	0.110	**0.029**				
EUE	-0.411	0.584	0.057	-0.114			
	0.001	**0.000**	0.663	0.384			
UEDIF	-0.271	0.097	0.446	-0.504	0.197		
	0.036	0.459	**0.000**	**0.000**	0.132		
OPEN	0.074	-0.040	-0.119	-0.123	-0.175	0.323	
	0.555	0.751	0.330	0.315	0.181	**0.012**	
TRDSRP	0.014	0.028	-0.036	0.115	-0.033	-0.499	-0.924
	0.914	0.825	0.770	0.347	0.800	**0.000**	**0.000**

Top Number: Correlation Coefficient, **Bottom Number:** P-Value

BOLD: P-Value Significant at 95% level or higher

Table 4: Correlation Coefficients & P-Values; "Best Model," EU14 Countries

	GDPDIF	*HICPDIF*	*UEDIF*	*RWAGE*	*OPEN*
HICPDIF	0.310				
	0.000				
UEDIF	0.025	-0.075			
	0.685	0.214			
RWAGE	0.310	0.703	0.026		
	0.000	**0.000**	0.699		
OPEN	0.117	-0.157	-0.480	-0.133	
	0.046	**0.006**	**0.000**	**0.030**	
TRDSRP	0.035	-0.027	-0.141	-0.095	-0.108
	0.555	0.642	**0.022**	0.124	**0.047**

Top Number: Correlation Coefficient, **Bottom Number:** P-Value

BOLD: P-Value Significant at 95% level or higher

Table 5: Correlation Coefficients & P-Values; "Best Model," EMU Countries

	GDPDIF	*HICPDIF*	*UEDIF*	*RWAGE*
HICPDIF	0.332			
	0.000			
UEDIF	0.033	-0.100		
	0.637	0.142		
RWAGE	0.384	0.764	0.083	
	0.000	**0.000**	0.279	
OPEN	0.151	-0.135	-0.551	-0.145
	0.024	**0.039**	**0.000**	**0.041**

Top Number: Correlation Coefficient, **Bottom Number:** P-Value

BOLD: P-Value Significant at 95% level or higher

Table 6: Correlation Coefficients & P-Values; "Best Model," EU3 Countries

	GDPDIF	*Gr(EHICP)*	*OPEN*	*RWAGE*
Gr(EHICP)	-0.414			
	0.001			
OPEN	-0.040	-0.119		
	0.751	0.330		
TRDSRP	0.028	-0.036	-0.924	
	0.825	0.770	**0.000**	

Top Number: Correlation Coefficient, **Bottom Number:** P-Value

BOLD: P-Value Significant at 95% level or higher