

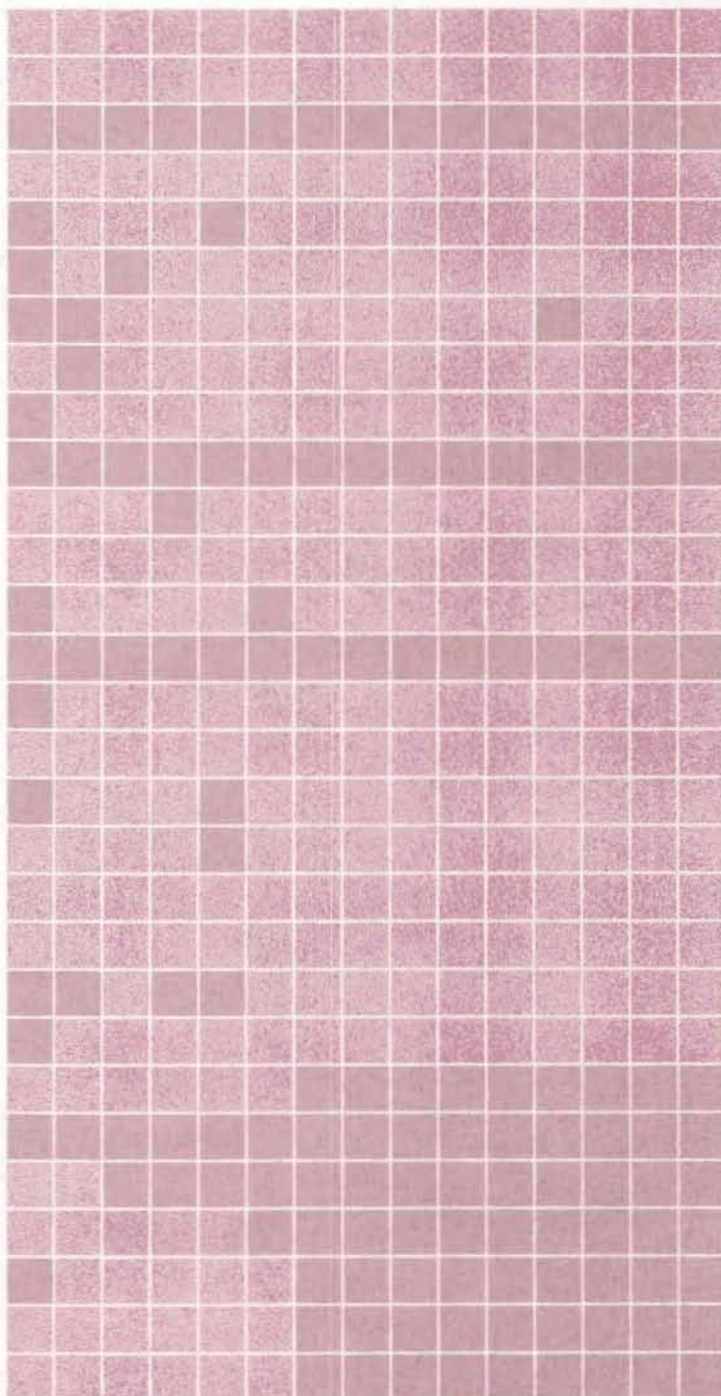
# Economic Review

*The Long-Run Effects of a  
Permanent Change in  
Defense Purchases*

Mark A. Wynne

*Europe 1992:  
An Overview*

Linda C. Hunter



# Economic Review

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#### *The Long-Run Effects of a Permanent Change in Defense Purchases*

Mark A. Wynne

In this article, Mark A. Wynne explores how a permanent reduction in defense spending might affect the average U.S. household. He finds that, in the long run, Americans will reap a peace dividend. For example, if Congress reduces annual defense spending from 6 percent of gross national product to 3 percent, in the long run private consumption as a share of GNP could rise 3 percentage points. In the short run, some businesses and households will sustain losses. Over time, however, the economy will reabsorb the resources freed by lower defense-related production and will expand production for private consumption.

Underlying Wynne's analysis is the assumption that Congress will use the funds saved on defense spending either to lower taxes or to reduce the federal deficit. Wynne develops a simple empirical model to explain the relationship between the share of GNP spent on private consumption and the share spent on defense over the past one hundred years.

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#### *Europe 1992: An Overview*

Linda C. Hunter

The European Community (EC) has embarked on a program popularly referred to as Europe 1992. The aim of the program is to achieve a unified European market that will overcome the economic stagnation and unemployment of the early 1980s and improve the position of EC members in the global economy. In 1985, the European Commission proposed almost 300 specific reforms that would reduce trade barriers between EC countries by 1992. By July 1990, the Commission had begun negotiations on 60 percent of these reforms, and many of them have already been adopted.

Linda C. Hunter examines the key measures that will contribute to European economic integration. She points out that while the gains from unification may be large, unification will benefit countries in the interior of Europe—such as Germany—more than EC-member nations on the periphery—such as Portugal, Spain, and Greece. Hunter observes that the countries on Europe's periphery may become discouraged and delay the process of unification. She concludes that while the EC may not meet all its goals by 1992, it will have made progress in liberalizing its internal trade, making Europe more integrated than it was in 1985.



## The Long-Run Effects of a Permanent Change in Defense Purchases

During the first half of 1990, there was widespread speculation that the recent easing of East-West tensions would allow deep cuts in the defense budget. Proposals for cutting the defense budget ranged from a 2-percent cut in real terms each year through fiscal 1995 to a halving of the defense budget by the end of the decade. Developments in the Middle East in the second half of 1990 tempered the more extreme proposals for cutting defense spending, but these developments seem likely to delay the budget-cutting process only temporarily. The implemented cuts will generate a peace dividend that will benefit the average American household.

The persistent budget deficits of the federal government over the past decade are also putting pressure on the defense budget. At present, defense purchases account for about 75 percent of total purchases of goods and services by the federal government and about 33 percent of total purchases of goods and services by all levels of government. Measured in 1982 dollars, defense purchases grew steadily from a low of \$157.5 billion in 1976 to \$265.1 billion in 1987. Since then, defense purchases have fallen in real terms to \$256.3 billion in 1989. With the defense budget looming so large in the overall spending plans of the federal government, it is not surprising that the defense budget is viewed as a potential source of savings that could be applied to the deficit.

Most discussions of the peace dividend that would accompany a reduction in defense purchases have been somewhat vague about the nature of the benefits of a smaller defense budget. I consider a policy change by which the savings generated by lower defense purchases are used to lower household taxes, or equivalently, the

budget deficit. I argue that a permanent reduction in defense purchases will make the average U.S. household better off by boosting its consumption and leisure. This result is first demonstrated in a simple theoretical model in which defense purchases yield no direct benefits to private households or firms. The average household is made better off because it will pay fewer taxes to finance defense purchases over the course of its life. The smaller tax burden raises household wealth, enabling it to enjoy higher levels of consumption even while working fewer hours.

To quantify the benefits of lower defense purchases, I focus on the gains in private consumption. The permanent income hypothesis states that a permanent reduction in household taxes will lead to a matching permanent increase in household consumption. By allowing households to choose how much to work, my theoretical model predicts that a decrease of 1 percentage point in the *share* of defense purchases in gross national product (GNP) would lead to an increase of 1 percentage point in the *share* of private consumption in GNP. I examine the relationship between these two shares in a simple empirical model and show that the predictions of the theory are consistent with the experience of the United States over the past hundred years. My empirical model predicts that reducing the size of the defense budget from 6 percent to 3 percent of GNP will add 3 percentage points to the share of

*I wish to thank Joseph H. Haslag, John K. Hill, and Evan F. Koenig for useful comments. Any errors, however, are my own.*

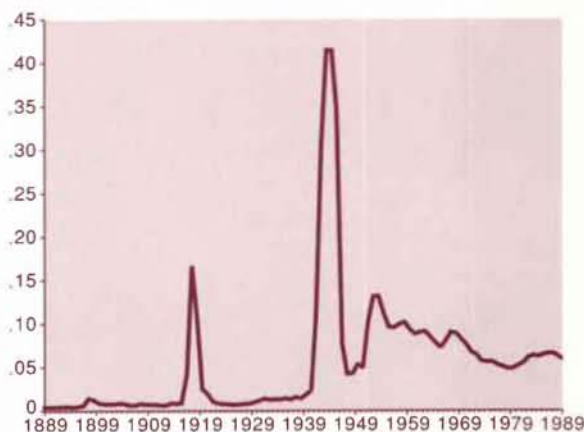
private consumption in GNP. Thus, even a reduction in the size of the defense budget that is not accompanied by any other major policy change will yield significant benefits to the average American household over time.

Finally, I address the issue of whether there is a relationship between the level of defense purchases and the growth rate of output in the long run. The model I use to analyze the effects of a permanent reduction in defense purchases does not allow for such a relationship. I briefly review several studies that have tried to determine whether such a relationship exists, and I find that the evidence is ambiguous. In the light of this finding, I argue that a cut in defense purchases in and of itself is unlikely to increase the growth rate of output in the long run.

### Defense spending in the U.S. economy

I have already noted that defense purchases of goods and services grew by more than \$100 billion in 1982 dollars between 1976 and 1987, and in 1989 defense purchases totaled \$256.3 billion. However, the absolute level of defense purchases is less important than its magnitude relative to the total volume of economic activity. A good measure of this relative magnitude is the share of defense purchases of GNP. In relative terms, defense purchases were 5.8 percent of GNP in 1989.<sup>1</sup> Over the postwar period (1947–89), defense purchases averaged 7.4 percent of GNP annually, although this average masks a fairly steady decline from a peak of 13.2 percent of GNP in 1953 to a low of 4.8 percent in 1978. For comparison, defense purchases reached an all-time high of 41.4 percent of GNP in 1944 at the height of World War II, and they were 16.7 percent of GNP in 1918 during World War I. The military buildup associated with the Carter and Reagan administrations took defense purchases

Figure 1  
Share of Defense Purchases in GNP



from a low of 4.8 percent of GNP in 1978 to a high of 6.6 percent in 1986. Since 1986, defense purchases have fallen steadily as a percentage of GNP and are projected to continue falling for the rest of the decade.

Figure 1 provides a historical perspective on the significance of defense purchases in the U.S. economy. The figure summarizes the behavior of defense purchases over the past hundred years and illustrates two points. First, there are four clear peaks in the share of defense purchases in GNP, which are associated with the major wars in which the United States participated during this period: World War I, World War II, Korea, and Vietnam. A less distinct peak appears in conjunction with the peacetime defense buildup in the 1980s. The wartime peaks in defense spending are essentially *temporary* phenomena because defense purchases are always cut drastically at the end of each war.

Figure 1 also illustrates that, whereas defense purchases fell to their prewar norm in the aftermath of World War I, a similar contraction did not occur following World War II. Defense purchases averaged 0.7 of 1 percent of GNP over 1900–13 and 0.8 of 1 percent over 1922–29. As already noted, defense purchases averaged 7.4 percent of GNP in the postwar period. In essence, there was a *permanent* increase in defense purchases in the aftermath of World War II, which was associated with the rise of the United States to superpower status and the outbreak of the Cold

<sup>1</sup> This share is the ratio of nominal defense purchases to nominal GNP. Measuring the share this way rather than as the ratio of real defense purchases to real GNP means that changes in the relative price of defense purchases will be picked up as changes in the share of defense purchases in GNP.



War. The easing of Cold War tensions since 1989 has created the possibility of a permanent reduction in the level of defense purchases in the future. I analyze the likely consequences of such a permanent change below.<sup>2</sup>

Now that I have discussed the significance of defense purchases in overall economic activity, how important are defense purchases in the budget of the federal government? Defense purchases of goods and services is by far the largest category of purchases in the federal budget. For example, in 1989 total federal government purchases of goods and services were \$400 billion, of which \$301.1 billion were purchases for national defense.<sup>3</sup> For comparison, total purchases of goods and services by all levels of government in 1989 were \$1,025.6 billion. The largest category of defense purchases in 1989 was purchases of services, which totaled \$203.3 billion. Included in this category are compensation of military personnel (\$78.8 billion), compensation of civilian employees of the defense department (\$40.2 billion), and a catchall "other services" (\$84.3 billion), which covers such items as payments for contractual research and development, the operation and maintenance of military installations, and various consultants' fees. Purchases of durable goods (such as aircraft, ships, and tanks) accounted for \$80.9 billion of total defense purchases in 1989. Purchases of nondurable goods (such as petroleum products and ammunition) accounted for \$10.4 billion, and purchases of structures accounted for \$6.4 billion. I will show that the composition of defense purchases is of some interest in terms of the short-run effects of budget cuts, but it is of less interest in the long run.

The likely course of defense purchases over the next decade has been the subject of much speculation in the light of recent political developments in Eastern Europe and the Soviet Union. Even without these developments, many observers considered the defense budget to be a prime candidate for cuts that would alleviate the federal government's budgetary problems. It is very likely that the military establishment will be scaled back from the levels reached at the height of the Carter-Reagan defense buildup; the most radical proposals envision a halving of the defense budget by the turn of the century. It should be remembered, however, that cutbacks have already begun. Since 1986, Congress has cut the defense

budget in real terms by about 2 percent each year. In the budget for fiscal 1991 presented to Congress at the beginning of 1990, the Bush administration projected annual cuts of the same magnitude through fiscal 1995. However, in the opinion of most analysts, such projections are a lower bound on what will actually transpire.

### **Modeling the effects of defense purchases on the economy**

To assess the consequences of a permanent reduction in the level of defense purchases, it is useful to begin with a simple analytical model of the macroeconomy.<sup>4</sup> Consider an economy in which final output is produced using a constant returns to scale technology. Capital and labor are the only inputs. Both inputs are productive but are subject to diminishing returns. The average household values both consumption and leisure, and additional time spent working directly lowers the amount of leisure time available to the household. The household also values consumption and leisure in the future, so it does not ignore the consequences of actions taken today on future consumption and leisure. The household has a positive rate of time preference, meaning that consumption and leisure in the present are valued more highly than consumption and leisure in the future. For the sake of simplicity, I will assume that the production process is directly owned and operated by households, so the saving decision of the household is the same as the investment decision of the firm.<sup>5</sup>

<sup>2</sup> For an analysis of the effects of temporary changes in defense purchases associated with wars using the same model, see Wynne (1989). Note that the model predicts that temporary changes in defense purchases have no long-run effects.

<sup>3</sup> All figures are from the U.S. Department of Commerce's Survey of Current Business, July 1990, Table 3.7.B.

<sup>4</sup> The model used here is a standard neoclassical model and is discussed at greater length in Barro (1987), chapters 2, 9, and 12.

<sup>5</sup> The assumption of competitive markets for goods and factors would not affect the analysis that follows.

Figure 2  
Intratemporal Equilibrium

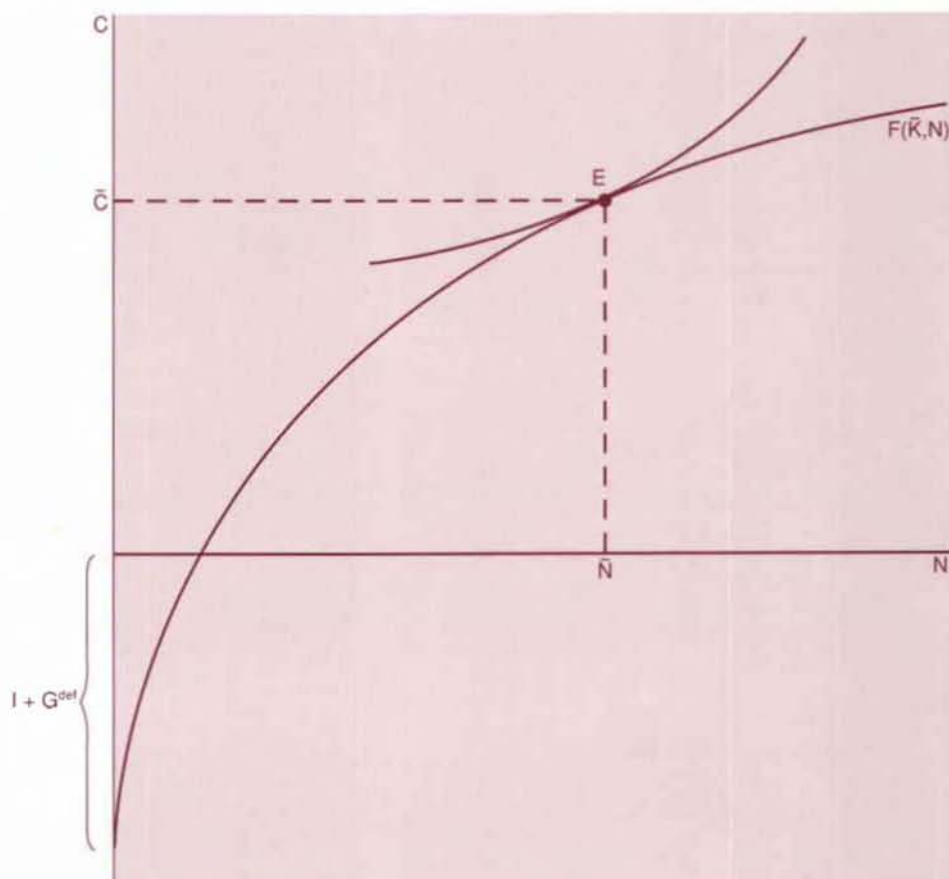


Figure 2 illustrates the equilibrium of this economy at a particular point in time. At any point in time, the average household has available to it some capital stock,  $\bar{K}$ , inherited from the past. This capital stock determines the production and consumption possibilities at that point in time. These possibilities are summarized in the production function  $F(\bar{K}, N)$ , where  $N$  is the level of work effort or employment. In addition to investment, the government purchases some portion of final output for defense,  $G^{def}$ . These two uses of final output lessen the consumption possibilities of the average household by shifting down the production function parallel to itself. The consumption possibilities of the average household are summarized by

$$(1) \quad C = F(\bar{K}, N) - I - G^{def},$$

where  $C$  denotes consumption, and  $I$  denotes gross investment. The level of defense purchases is beyond the control of the average household. So, too, is the capital stock at any particular point in time. Thus, given the average household's decision about how much to invest, to which  $I$  will return immediately, the only way it can increase its consumption is by working more. For given values of  $\bar{K}$  and  $G^{def}$ , and given the choice of  $I$ , a small increase in the amount of work effort,  $\Delta N$ , will increase the amount of output available for consumption by  $\Delta C = F_N(\bar{K}, N)\Delta N$ , where  $F_N(\bar{K}, N)$  is the marginal product of labor.

The average household will work up to the point where the additional consumption it can get from working one more hour just equals the additional consumption it requires to be induced to



work one more hour. The additional consumption the average household requires to be induced to work one more hour is  $\Delta C = -U_N(C, N)/U_C(C, N) \Delta N$ , where  $U_N(C, N)/U_C(C, N)$  is the marginal rate of substitution between consumption and work effort. The utility-maximizing combination of consumption and work is given by the requirement that the marginal rate of substitution between consumption and work effort is equal to the marginal product of labor, and is written

$$(2) \quad U_N(C, N)/U_C(C, N) = F_N(K, N).$$

Point *E* in Figure 2 illustrates this equilibrium, with the average household consuming  $\bar{C}$  and supplying  $\bar{N}$  hours of work.

Because the average household is forward-looking and derives utility from consumption and leisure in the future as well as the present, it will also decide at each point in time how much to invest. The size of the existing capital stock relative to the optimal capital stock,  $K^*$ , determines whether there will be net investment or disinvestment. If  $\bar{K}$  is less than  $K^*$ , there will be net investment; that is, the household will add to its capital stock more than is needed to replace capital lost because of depreciation. Over time, the capital stock is adjusted until it equals its optimal long-run level,  $K^*$ .

The optimal capital stock is determined by the requirement that the net marginal product of capital equal the pure rate of time preference. Because of the assumption of constant returns to scale, the optimality condition that determines the capital stock can also be thought of as determining the capital-labor ratio,  $\kappa$ .<sup>6</sup> Thus,

$$(3) \quad F_K(\kappa, 1) - \delta = \rho,$$

where  $\rho$  is the pure rate of time preference. This equation says that the household accumulates capital up to the point where the increase in future consumption obtained by increasing the capital stock by one unit,  $\Delta C_{t+1} = [F_K(\kappa, 1) - \delta] \Delta K_t$ , just equals the increase in future consumption that the household requires to be induced to save (in other words, not consume) one unit of current output,  $\Delta C_{t+1} = (1 + \rho) U_C(C_t, N_t)/U_C(C_{t+1}, N_{t+1}) \Delta K_t$ . In long-run, or steady-state, equilibrium, consumption and work effort are constant and

equation 3 follows. Higher rates of time preference,  $\rho$ , or depreciation,  $\delta$ , will lower the capital-labor ratio. Upward shifts in the marginal productivity of capital schedule,  $F_K$ , will raise the capital-labor ratio.

The terms of the long-run trade-off between consumption and work effort are given by the following relationship:

$$(4) \quad C = N[F(\kappa, 1) - \delta\kappa] - G^{def}.$$

The rate of depreciation of capital,  $\delta$ , and the level of defense purchases,  $G^{def}$ , are determined independently of household decisions about consumption and work effort, so the long-run trade-off between  $C$  and  $N$  is linear. Higher levels of defense purchases cause the trade-off to shift down parallel to itself. Changes in the parameters that determine the capital-labor ratio, such as  $\rho$  and  $\delta$ , cause it to change slope. This trade-off is the line  $LL$  in Figure 3.

The last thing to be determined is the combination of consumption and work effort chosen by the average household in steady-state equilibrium. To do this, note that there is a unique real wage, or marginal product of labor, associated with the unique steady-state capital-labor ratio, given by

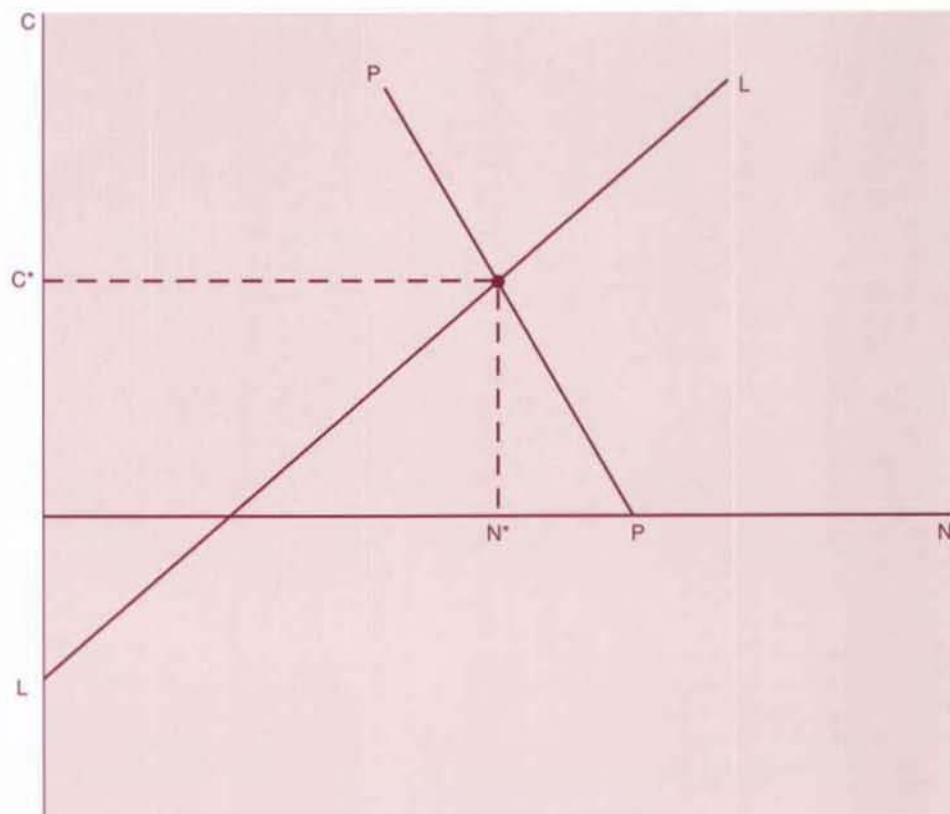
$$(5) \quad w = F_N(\kappa, 1).$$

This real wage defines an output-expansion path, giving the combinations of consumption and work effort chosen by the average household at this real wage for different levels of investment and defense spending. The output-expansion path associated with the steady-state real wage is the line  $PP$  in Figure 3. This line begins at the point representing the total amount of time available to the average household when making consump-

<sup>6</sup> The assumption of constant returns to scale is simply another way of saying that the production function is homogeneous of degree one in  $K$  and  $N$ . Homogeneity of degree one means that  $F(\lambda K, \lambda N) = \lambda F(K, N)$ , where  $\lambda$  is any positive real number. It can be shown that the partial derivatives of a function that is homogeneous of degree one are homogeneous of degree zero. Thus,  $F_K(\lambda K, \lambda N) = F_K(K, N) = F_K(K/N, 1) = F_K(\kappa, 1)$ .



Figure 3  
Intertemporal Equilibrium



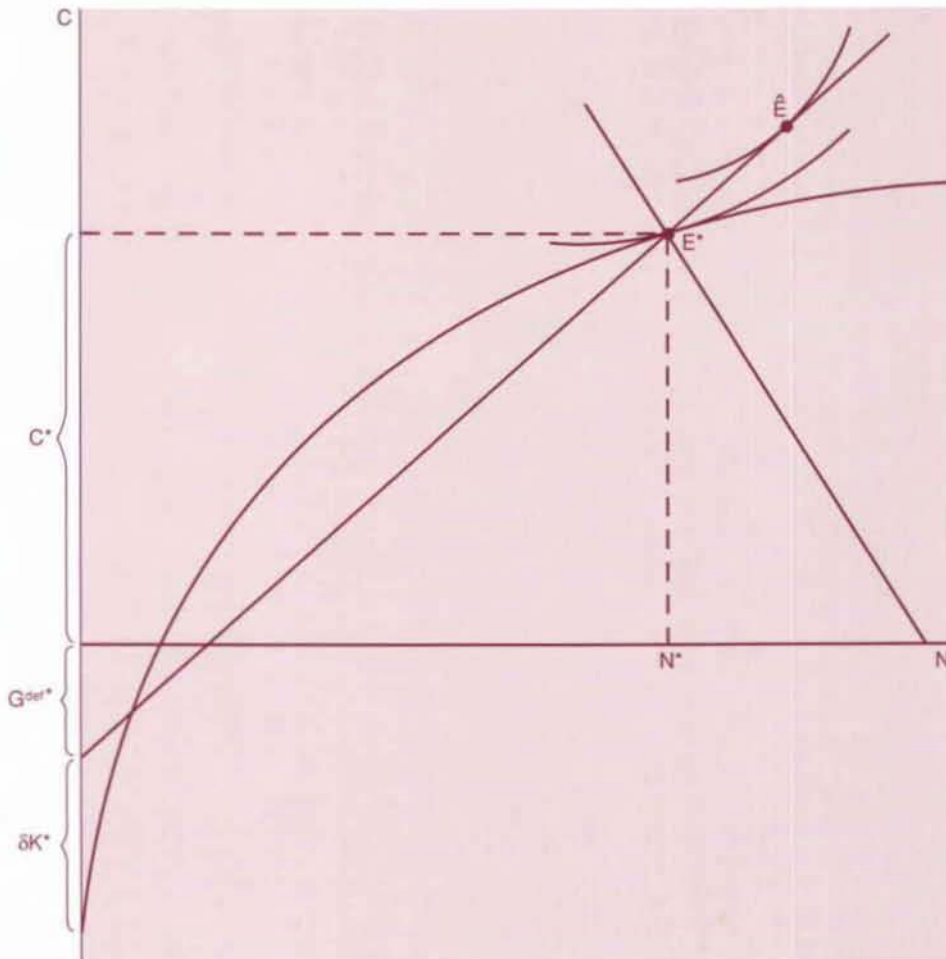
tion and investment decisions and slopes up from right to left because both consumption and leisure are normal goods. There is an infinite number of similar output-expansion paths associated with different real wage rates. Those paths lying above and to the right of  $PP$  are associated with higher real wage rates, while those paths lying below and to the left of  $PP$  are associated with lower real wage rates. The steady-state choices of consumption and work effort are determined by the intersection of this line with the  $LL$  line. At this

point, the economy is in long-run equilibrium, or steady-state equilibrium, in which all the dynamics associated with the convergence of the capital stock to its optimal steady-state level have ceased.<sup>7</sup>

Figure 4 combines Figures 2 and 3, showing all the details of the steady-state equilibrium. This equilibrium is at the point  $E'$ , and the requirements of both short-run and long-run equilibrium are satisfied. Total output in this equilibrium is divided between three uses: consumption, investment, and defense purchases. The average household is consuming  $C'$  and devoting  $N'$  of its time to work effort. There is no net investment in the steady state of this model. All steady-state investment is replacement investment, which is simply  $\delta K'$ , where  $K'$  is the steady-state capital stock as determined by the interaction of the rate

<sup>7</sup> The only dynamics in this model are those arising from the transition of the capital stock from some initial level to its desired long-run level. The inclusion of growth due to exogenous labor-augmenting technical progress would not materially alter the analysis.

Figure 4  
Long-Run Equilibrium



of time preference and the marginal productivity of capital. Finally, the steady-state level of defense purchases is  $G^{def}$ .

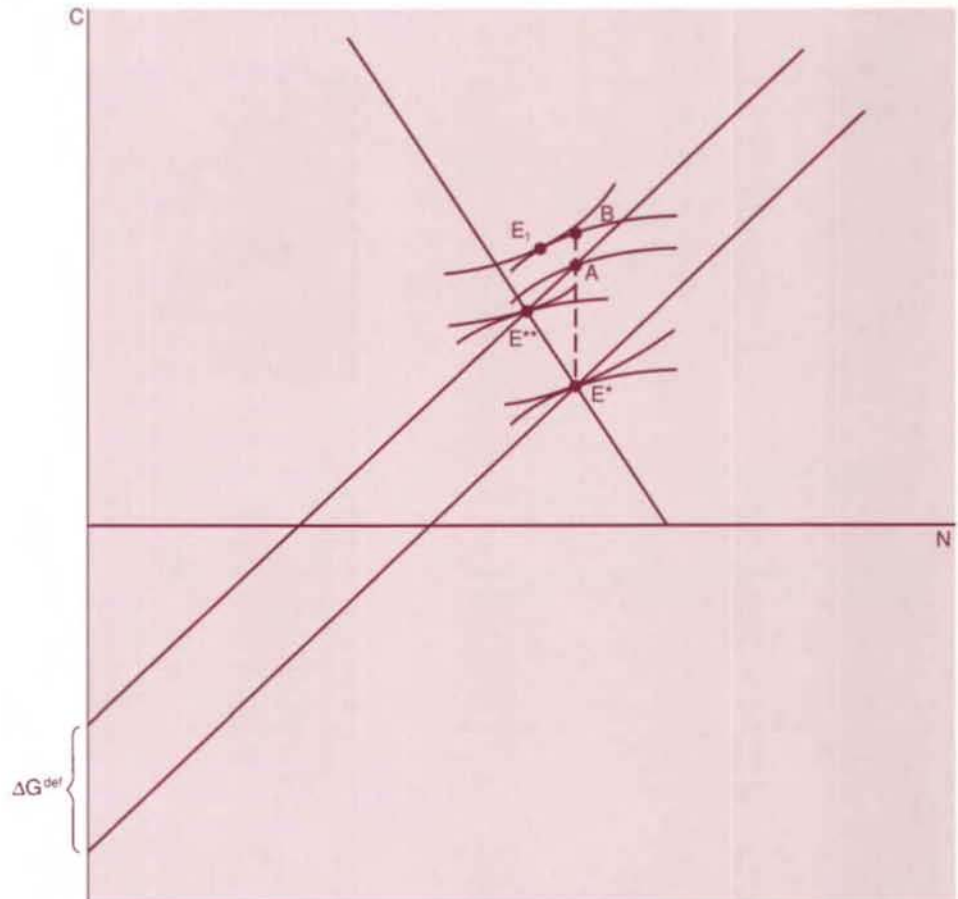
A question that naturally arises is, How can I rule out the point  $\hat{E}$  as a steady-state equilibrium? Comparing  $\hat{E}$  to  $E^*$ , it is clear that the average household is unambiguously better off, not only consuming more final output but also working more.  $\hat{E}$  lies above the short-run production function associated with the steady-state capital stock,  $K^*$ , and is therefore only attainable by running down the capital stock. The need to disinvest for  $\hat{E}$  to be an equilibrium means it cannot be sustained as an equilibrium in the long run.

### A permanent reduction in defense purchases

What happens if the government reduces the steady-state level of defense purchases? A reduction in steady-state defense purchases in this model is the analytical counterpart of the sort of permanent reduction in the defense budget that is currently under consideration. Figure 5 illustrates the effects of such a cut. The long-run trade-off between consumption and work effort shifts up parallel to itself by the amount of the reduction in defense purchases,  $\Delta G^{def}$ . This shift occurs because the fall in demand for final output for defense increases the amount of output available for



Figure 5  
A Cut in Defense Purchases of Final Output



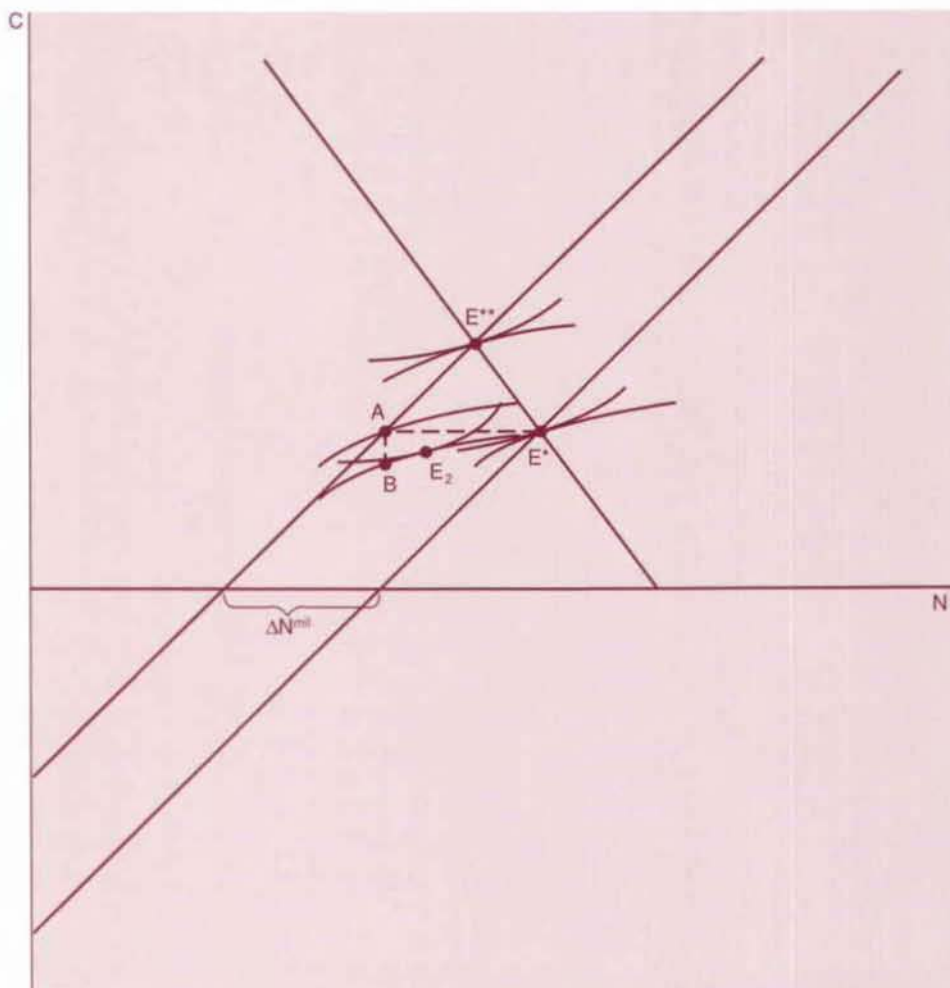
consumption at every level of work effort. The short-run trade-off between consumption and work effort also shifts up parallel to itself by the amount of the reduction in defense purchases. It also shifts up an additional amount,  $AB$ , because some of the surplus capital that is no longer needed to produce defense goods can be used to augment current consumption. The economy moves to a short-run equilibrium at  $E'$ , where the average household is working fewer hours and consuming more than at the initial equilibrium  $E$ . Over time, the capital stock is run down, and the economy moves toward the new long-run equilibrium at  $E''$ . In this equilibrium, the average household is unambiguously better off than at  $E'$ , working fewer hours and consuming more final output.

The intuition for this result is straightforward. A permanent reduction in the level of defense purchases of final output increases household wealth by lowering its current and future tax burden. The average household then uses this increased wealth to finance increased consumption purchases of final output and increased leisure.

### A permanent reduction in defense manpower

Figure 5 also can be used to illustrate the effects of a cutback in defense purchases that takes the form of reduced manpower requirements rather than reduced purchases of final output. The long-run effects of the two cuts are qualitatively similar,

Figure 6  
A Cut in Defense Manpower Requirements



but the short-run effects differ. Military employment is analyzed in this model by assuming that the average household spends part of its time in the military and part of its time at private productive activities. The aggregate implications of this assumption are no different from assuming that some households spend all their time working for the military, while others spend all their time working in the private sector. Figure 6 illustrates the effects of a reduction in the number of hours that the average household must work for the military. The long-run trade-off between consumption and work effort shifts to the left parallel to itself by the

amount of the reduction,  $\Delta N^{mil}$ . The short-run trade-off also shifts to the left parallel to itself by the same amount. However, the short-run trade-off also shifts down parallel to itself by an additional amount,  $AB$ . The reason is as follows. The permanent reduction in the manpower requirements of the military increases household wealth as before. Both consumption and leisure increase, and total hours of work decrease. But time spent working in the private sector will increase, raising the marginal product of capital and the steady-state capital stock. The additional investment needed to increase the steady-state capital stock temporarily worsens the



short-run consumption possibilities of the average household but improves them in the long run. An initial equilibrium is established at  $E_2$  with increased private-sector employment and lower consumption. Over time, the economy moves toward the new long-run equilibrium,  $E''$ , where again the average household is better off than at the initial equilibrium,  $E'$ , with higher levels of consumption and leisure.

The intuition for this result is the same as that for a permanent reduction in defense purchases of final output. I model military service as a tax in kind. A permanent reduction in the manpower requirements of the military lowers the tax burden of the average household, thereby increasing its wealth. As before, this increased wealth is used to finance an increase in consumption and leisure.

### Comparison of the policies

Both cuts in defense purchases of final output and cuts in military manpower requirements increase the consumption and leisure of the average household. However, the implications for other quantities and prices in the model are different. Whereas a permanent reduction in purchases of final output puts downward pressure on real interest rates and upward pressure on real wages during the transition to the new long-run equilibrium, a permanent reduction in manpower requirements has just the opposite effect, raising real interest rates and lowering real wages. A cut in purchases of final output reduces labor supply by raising household wealth. Firms need to pay higher wages to retain workers as the economy adjusts. Increased household wealth also lowers the optimal capital stock, putting downward pressure on real interest rates while the capital stock is run down to its new lower level. A reduction in defense manpower requirements releases extra workers into the labor market, putting downward pressure on real wages. Household wealth increases, but because more effort is now devoted to private productive activity, the optimal steady-state capital stock is higher. The temporary shortage of productive

capital while the capital stock is built up to its new higher level puts upward pressure on real interest rates during the transition.

Table 1 summarizes the results of both policies. For real wages and interest rates, I distinguish between short-run and long-run effects. The absence of any effects on either of these variables in the long run is a direct implication of the assumption of a constant-returns-to-scale technology. As I have already noted, the assumption of constant returns to scale means that marginal products, and thus real factor rewards, are determined solely by the capital-labor ratio,  $\kappa$ . Because changes in defense purchases of final output and military manpower do not affect the steady-state of  $\kappa$ , neither will they affect real wages or real interest rates in the long run.

The different short-run effects of the two policies are crucially dependent on the elasticity of labor supply. Furthermore, they are probably less significant than the long-run response of private consumption purchases to a permanent reduction in defense purchases. In what follows, I will look only at the historical relationship between defense purchases and private consumption purchases because the prediction that this relationship is negative is more robust to various changes in the model than are some of the model's other predictions.

### Some empirical evidence on the steady-state properties of the model

One of the key steady-state or long-run features of this model is that any permanent increase in the proportion of final output allocated to defense must be offset by an equal decline in the proportion allocated to private consumption.<sup>8</sup> The reason for this feature is that the capital-output ratio is determined solely by the parameters of tastes and technology. Changes in the level of government purchases or the share of government purchases in GNP, therefore, have no effect on the capital-output ratio in the long run. I have already noted that all investment in the steady-state is replacement investment,  $\delta K$ . Thus, the share of steady-state investment in steady-state output,  $(\delta K/Y)$ , is also invariant to changes in the level of defense purchases or the share of defense purchases in GNP. Simple arithmetic, then, requires that changes in the share of defense

<sup>8</sup> See the Appendix for a detailed derivation.

Table 1  
**Consequences of a Permanent Cut in Defense Purchases**

Effect on:	Cut Purchases of Final Output	Cut Manpower
Consumption	Increase	Increase
Leisure	Increase	Increase
Private employment	Decrease	Increase
Capital stock	Decrease	Increase
Real wages		
Short-run	Increase	Decrease
Long-run	No change	No change
Real interest rates		
Short-run	Decrease	Increase
Long-run	No change	No change

purchases be fully reflected in changes in the share of consumption purchases.<sup>9</sup>

The foregoing conclusion is sensitive to how the government is assumed to finance its defense purchases. So far, I have assumed that the government can finance all purchases of goods and services by lump-sum taxation. However, when purchases must be financed by distortionary taxes, a change in the share of steady-state output absorbed by the government will no longer leave the share allocated to private investment unchanged. The relationship between the share of consumption and the share of defense purchases is now

$$(6) \quad \theta_c = (1 - \delta\mu) (1 - \theta_{def}),$$

where  $\theta_c$  is the share of consumption in GNP,  $\mu$  is the capital-output ratio in the absence of distortionary taxation, and  $\theta_{def}$  is the share of defense purchases in GNP.<sup>10</sup> The burden of increased defense purchases in the steady state is borne partly by lower consumption and partly by lower investment. Increased defense purchases necessitate higher distortionary taxes, which in turn lower the return to investment (the post-tax marginal product of capital) and thus lower the steady-state capital stock. Commonly used estimates of the parameters that determine  $\mu$  are  $\rho = 0.01$ ,  $\delta = 0.1$ , and  $\theta_k = 0.33$ . This gives us  $(1 - \delta\mu) = 0.7$ , so a 1-percentage-point increase in the share of defense purchases in GNP would cause a two-thirds of 1-percentage-

point decline in the share of consumption in GNP.

Figure 7 presents some casual evidence of a negative relationship between the shares of consumption and defense purchases over time. Here, I plot the movements in these two variables over one hundred years, from 1889 to 1989.<sup>11</sup> The figure also includes a single regression line for reference. As predicted by the theory outlined in the previous section, there is a negative relationship between the share of defense purchases in GNP and the share of private consumption purchases. While the observations associated with the war years 1942–45 seem to be outliers and particularly influential, the finding of a negative relationship is robust to the omission of these observations.

Further evidence on the relationship between the two shares is given by the following

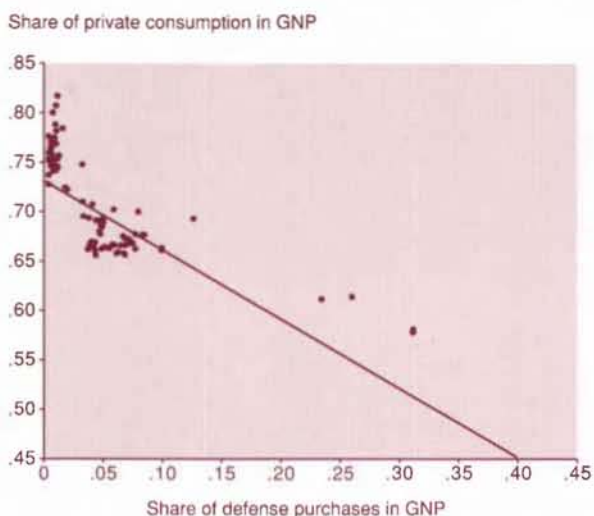
<sup>9</sup> If labor supply is inelastic, changes in the level of defense purchases are offset by changes in the level of consumption purchases.

<sup>10</sup> See the Appendix for a detailed derivation.

<sup>11</sup> Official national-accounts estimates are not available for the years before 1929. For the earlier period, I used the estimates of GNP, consumption, and defense spending in Kendrick (1961), Appendix A. Kendrick's estimates were constructed on a similar basis to those of the Commerce Department and can be considered comparable to the official series.



Figure 7  
Cross Plot of the Share of Private Consumption in GNP and the Share of Defense Purchases in GNP



regression equation:

$$\begin{aligned} \log(\theta_{c,t}/(1-\theta_{c,t})) &= 0.014 + 0.692 \cdot \log(\theta_{c,t-1}/(1-\theta_{c,t-1})) \\ &\quad (0.036) \quad (0.079) \\ &\quad - 0.152 \cdot \log(\theta_{def,t}/(1-\theta_{def,t})) \\ &\quad (0.027) \\ &\quad + 0.084 \cdot \log(\theta_{def,t-1}/(1-\theta_{def,t-1})) \\ &\quad (0.031) \end{aligned}$$

$$R^2 = 0.88 \quad DW = 1.99 \quad S.E. = 0.116 \quad F = 215.57.$$

The standard errors of the coefficient estimates are

<sup>12</sup> I applied the logistic transformation  $\log(x/(1-x))$  to the dependent and independent variables to ensure that the model was data-admissible (see Hendry and Richard, 1982 and 1983).

<sup>13</sup> We can also estimate the following cointegrating regression:  $\log(\theta_{c,t}/(1-\theta_{c,t})) = 0.059 - 0.219 \log(\theta_{def,t}/(1-\theta_{def,t}))$ . The standard error of the estimated coefficient of the transformed share of defense purchases is 0.012. The Durbin-Watson statistic from this regression is 0.66. This exceeds the 5-percent critical value from Engle and Granger (1987), so we can reject the null of no cointegration between the two variables. We are also able to reject the null of no cointegration when we carry out Dickey-Fuller and Augmented Dickey-Fuller tests on the residuals from the cointegrating regression.

in parentheses. This equation was estimated by ordinary least squares using annual data for the period 1889–1979, with the observations from 1980–89 retained to evaluate the out-of-sample forecasting performance of the model.<sup>12</sup>

By standard statistical criteria, the model fits the data well. All the coefficient estimates are significant at the 5-percent level. There is no evidence of serial correlation or heteroskedasticity in the residuals. Tests for omitted variables and misspecification of functional form further support the model. Table 2 summarizes these and other tests of model specification. The within-sample tracking performance of the model is quite good, as is its out-of-sample forecasting ability. I cannot reject the hypothesis that there is no bias in the out-of-sample forecasts of the model during the 1980s. On the basis of these findings, I can be confident that the model provides a sound basis for predicting the long-run effects of a permanent cut in the share of defense purchases in GNP on the share of consumption purchases in GNP.

One issue that should be addressed before proceeding is whether the stationarity assumptions that underlie the asymptotic theory used for drawing inferences about the coefficient estimates in the model are satisfied. Tests for unit roots in both  $\log(\theta_c/(1-\theta_c))$  and  $\log(\theta_{def}/(1-\theta_{def}))$  suggest that both these variables are nonstationary. However, it is possible to write all the parameters of interest as coefficients on mean zero, nonintegrated regressors. Therefore, the results of Sims, Stock, and Watson (1990), namely that such parameters have normal asymptotic distributions, are applicable in this case.

The solved static long-run equation associated with this model is

$$\begin{aligned} \log(\theta_c/(1-\theta_c)) &= 0.044 - 0.221 \cdot \log(\theta_{def}/(1-\theta_{def})) \\ &\quad (0.115) \quad (0.030). \end{aligned}$$

Again, the standard errors are in parentheses. This equation shows the relationship between the share of consumption in GNP and the share of defense purchases in GNP when the share of defense purchases is constant and the regression errors take on their expected value of zero. A Wald test of the null hypothesis that all the long-run coefficients are zero yields  $\chi^2(2) = 72.178$ , which enables us to reject the null at standard significance levels.<sup>13</sup>

**Table 2**  
**Diagnostic Tests**

Test for	Statistic	Pr(F>f)
Serial correlation		
First-order	F(1,85)=.15	.7027
First- to sixth-order	F(6,80)=.35	.9074
Heteroskedasticity	F(6,79)=1.46	.2013
ARCH		
First-order	F(1,84)=.19	.6679
First- to sixth-order	F(6,74)=.30	.9364
Parameter constancy		
Over 1980–89	F(10,86)=.11	.9997
Omitted variables	F(1,85)=1.801	.1832
Functional form	F(9,76)=1.218	.2968
Normality	$\chi^2(2)=56.305$	

NOTE: All estimation and testing was carried out using PC-GIVE. The tests are fully documented in Hendry (1989).

This equation provides a basis for calculating the long-term effects on the share of private consumption purchases in GNP of a permanent change in the share of defense purchases in GNP. The model suggests that a reduction in the share of defense from 6 percent to 3 percent of GNP would eventually add about 3 percentage points to the proportion of GNP allocated to private consumption purchases.

### Defense spending and economic growth

Is there any reason to expect sustained increases in the growth rate of output from cuts in defense purchases? The theoretical discussion above abstracted from growth effects and focused on the allocation of final output in long-run, steady-state equilibrium. It would be relatively straightforward to include growth driven by exogenous technical change in the model, in which case the steady-state equilibrium would be one in which consumption, output, and the capital stock were growing at a common rate. In such an extended version of the basic model, permanent cuts in defense purchases would lead to a temporary period of slower growth as the economy adjusted to the new allocation of output, but in the long run the growth rate would return to its original level.

In practice, however, many analysts believe that the level of defense purchases has implications for an economy's growth rate in the long run. Defense purchases might affect growth through several channels. First, defense purchases are one component of the grand total of government expenditures that must be financed by raising tax revenue. The system of taxes that has been constructed to this end distorts the incentives of individual households and firms to save and invest, not always for the best. A cut in defense purchases that is used to finance a cut in taxes on capital income of various kinds would stimulate investment and economic growth.<sup>14</sup> Second, high levels of military research and development spending drain productive resources from the private sector that otherwise would be employed in the development of new products and technologies by private firms. Such development is essential to retaining and increasing market share in the face of international competition, thus, it is essential to growth over the long

<sup>14</sup> For example, Lucas (1989) has estimated that eliminating capital income taxation would increase the U.S. capital stock by 35 percent.



run. A cut in military research and development (R&D) that frees scarce R&D resources for private-sector use will stimulate the underlying rate of economic growth.<sup>15</sup> Finally, military spending crowds out other more productive forms of government spending, such as investment in education and infrastructure. As David Aschauer (1989) recently noted, the quality and quantity of the public capital stock in part determines the rate of return on many private investment projects. The deterioration in the stock of public capital over the past twenty years is well-documented and contributed to the productivity slowdown that occurred over the same period. The importance of education and human capital accumulation in economic growth is also well-known and may be the single most important determinant of growth over long periods.

What is the evidence on the relationship between military expenditure and economic growth? Empirical studies of the relationship between military spending and economic growth fall into two broad categories. First, some studies focus explicitly on this relationship and ignore how other components of government spending may influence growth. One paper in this category is Faini, Annez, and Taylor (1984). They find that military spending has a clear negative effect on the growth rate. Their results are strongest for less-developed countries, but they are unable to find any significant relationship for the developed countries. The second category of papers focuses on the relationship between government consumption purchases, broadly defined, and economic growth. Included in this category are the papers by Kormendi and Meguire (1985), Grier and Tullock (1989), Ram (1986), and Landau (1983). These papers reach conflicting conclusions concerning the influence of government purchases on economic growth. Ram (1986) finds a positive effect, Kormendi and Meguire (1985) find no effect, and Grier and Tullock (1989) and

Landau (1983) find a negative effect. In Barro (1989a), government spending is decomposed into consumption spending, infrastructural investment, spending on education, military spending, and spending on social programs. Barro is unable to find any relationship between the share of defense spending in gross domestic product (GDP) and the growth rate of GDP.

In view of the conflicting findings of these studies, it is unclear whether the United States can expect any sustained increase in the growth rate of output as a result of permanent reductions in its defense budget. Furthermore, the ambiguity of the evidence indicates that my modeling strategy of excluding a relationship between defense purchases and output growth is appropriate as a first approximation to reality.

## Conclusion

I have argued that the principal gain that will accompany a permanent reduction in defense purchases will be an increase in private consumption that will make the average household better off in the long run. I quantified the effects of a reduction in the defense budget on the share of consumption in GNP and showed that a halving of defense purchases in the form of a reduction from 6 percent to 3 percent of GNP could be expected to increase the share of private consumption in GNP by 3 percentage points in the long run. It is unlikely that there will be sustained changes in real interest rates. It is also unlikely that there will be any sustained change in the economy's rate of growth.

My analysis abstracts from the short-term adjustment costs that some households and firms will bear as defense spending is cut, but in the absence of major structural rigidities it is unlikely that these costs will persist. Firms that produce exclusively for the military will experience difficulties, and some of them will go out of business. But as these firms close, they will free scarce resources of capital and labor that will eventually be employed in other sectors producing consumption goods. The costs incurred during the process of reallocating these resources will, in any case, be offset by the gain that lower defense spending will eventually create for most households and firms.

<sup>15</sup> One sometimes hears the opposite argument that military research and development has valuable spin-off effects for the private sector. It seems plausible that these benefits only partly offset the costs of a large military research establishment.



## Appendix

As I have already noted, the steady-state capital stock is determined by the condition that the net marginal product of capital equals the pure rate of time preference,

$$F_k(K, N) - \delta = \rho.$$

Rearranging terms and premultiplying both sides by the capital-output ratio gives us

$$\frac{F_k(K, N)K}{Y} = \theta_k = (\rho + \delta) \frac{K}{Y}.$$

Under the assumption of constant returns to scale, the steady-state capital-output ratio is given by

$$\frac{K}{Y} = \frac{\theta_k}{\rho + \delta} \equiv \mu,$$

where  $\theta_k$  is the share of capital income in total steady-state income. Because all investment in the steady-state equilibrium is replacement investment, the share of investment in steady-state output is

$$\theta_i = \frac{\delta K}{Y} = \frac{\delta \theta_k}{\rho + \delta} = \delta \mu.$$

By definition,

$$1 = \theta_c + \theta_i + \theta_{def},$$

where  $\theta_c$  is the share of consumption in steady-state output,  $\theta_i$  is the share of investment in steady-state output, and  $\theta_{def}$  is the share of defense purchases of final output in steady-state output. Because  $\theta_i$  is invariant with respect to changes in  $\theta_{def}$ , the share of steady-state output allocated to private consumption must fully reflect changes in the share of steady-state output absorbed by the

government. This suggests that in a regression of the share of private consumption purchases in GNP on the share of defense purchases in GNP the coefficient should be  $-1$ .

What if, instead of financing its purchases by nondistortionary lump-sum taxation, the government must rely on a distortionary tax on total (gross) income? In that case, the steady-state capital-output ratio would be

$$\frac{K}{Y} = \frac{(1 - \tau)\theta_k}{\rho + \delta} = (1 - \tau)\mu,$$

where  $\tau$  is the steady-state tax rate. If the government is required to balance its budget each period and has no debt outstanding initially, its budget constraint is

$$G_t^{def} = \tau_t Y_t,$$

which in the steady state simplifies to  $\tau = \theta_{def}$ . Even if the government has the ability to issue debt to finance spending, the relevant budget constraint requires that in the long run the average tax rate equal the share of spending in final output.

Rearranging the adding-up condition on expenditure shares, we have

$$\theta_c = 1 - \theta_i - \theta_{def}.$$

Substitution for  $\theta_i$  in this equation using the above gives us

$$\theta_c = 1 - (1 - \tau)\delta\mu - \theta_{def},$$

which can be further simplified as

$$\theta_c = (1 - \delta\mu)(1 - \theta_{def}),$$

which is equation 6 in the text.

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## Europe 1992: An Overview

To overcome the economic stagnation and unemployment that characterized the early 1980s, the European Community (EC) has embarked on a unification program. In 1985, Jacques Delors, president of the European Commission, and his fellow commissioners presented a proposal to invigorate the European economy. This *white paper* called for the elimination of internal trade barriers by the end of 1992. Titled "Completing the Internal Market," the white paper sets forth approximately 300 directives to achieve a unified European market. The literature refers to this program as *Europe 1992*.

Although the EC—which consists of Belgium, Britain, Denmark, France, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, and West Germany<sup>2</sup>—is referred to as a *common market*, this term is a misnomer. Within a common market, there are no barriers to the movement of goods or factors of production. Even though all formal tariffs and quotas in trade have been eliminated within the EC, regulatory impediments still obstruct the flow of goods and factors of production. Acceptance of the white paper proposals will ensure the complete mobility of goods and factors of production. If this occurs, then the term *common market* will be more appropriate for the EC.

This article examines the white paper proposals and the effects of the elimination of regulatory barriers on Europe. In an effort to press for acceptance of the entire unification program, the European Commission has not set priorities on the white paper proposals. However, four key measures will contribute to the objective of a unified Europe. These measures are the elimination of border controls, opening of public procurement, harmonization of technical standards and regula-

tions, and liberalization of capital movements and related financial services. Removal of these restrictions to intra-EC trade will eliminate many distortions in the European marketplace.

Although estimates vary considerably, Europe's gains from becoming a unified market are potentially large. Not only will immediate cost-saving benefits result from the removal of regulatory impediments, but also longer-term gains will result from increased competition and firms' exploitation of scale economies. Europe's gains will not be evenly distributed among member countries, however. Most studies suggest that unification will benefit countries on the periphery—such as Portugal, Spain, and Greece—less than those in the interior of Europe, such as West Germany. Analysts have expressed concern that these outlying countries will become discouraged and delay the process of unification.

### Proposed elimination of regulatory barriers

Most tariffs and quantitative restrictions within the EC have been eliminated since its formation in 1957, but the Community members continue to operate as individual countries with their own laws and regulations. Consequently, many barriers to

*I would like to thank Steve Brown, Bill Gruben, Kent Hill, and Mine Yücel for helpful comments.*

<sup>1</sup> Linda C. Hunter is a former economist at the Federal Reserve Bank of Dallas.

<sup>2</sup> The data for this article refer to West Germany before unification with East Germany.



trade still exist. The white paper contains approximately 300 proposals to eliminate these remaining barriers. Michael Calingaert (1988) has organized the white paper proposals into eight headings.<sup>3</sup>

**Border controls.** Border controls are clearly the most visible remaining barriers. Even though customs duties are no longer collected at national frontiers, border controls remain because regulations and laws differ across member countries. Border controls ensure that appropriate taxes, which still vary greatly among EC-member nations, are paid to the member countries. Border authorities also enforce health standards on plant and animal products and adjust prices in accordance with the Common Agricultural Policy.

According to a recent survey, businesses consider delays at the border to be the most obstructive barriers they face.<sup>4</sup> Although consumers and travelers also bear the costs of delays at the border in the form of higher prices and inconvenience, delays appear to be a greater burden to companies. Estimates place the cost of delays at borders at almost \$10 billion annually.<sup>5</sup>

The white paper's most significant proposal for removing border controls is the introduction of the Single Administrative Document. EC-member nations enacted this measure in January 1988. This document consolidates the many forms member governments have required at their borders. The Single Administrative Document serves as an export declaration, transit document, and import entry statement.

The white paper also proposes the elimination of road haulage permits and quotas that remain between certain member countries.

**Movement of people.** In general, individuals have complete freedom to move from one member country to another for work, but academic degrees and professional qualifications are

not uniformly recognized across countries. Before the white paper was written, EC-member countries negotiated to recognize certain degrees on a profession-by-profession basis. The white paper proposes a general framework for mutual recognition of all degrees and diplomas in all professions.

**Legal differences.** Each EC-member nation has its own national laws, and this has served as a major impediment to trade within the EC. As a result, the processes of forming joint ventures, establishing mergers across countries, and creating other forms of multinational businesses are much more complicated than if the EC were an integrated market. Intellectual property rights are also handled on a national basis; trademarks and patents are issued by individual countries rather than through a central EC office.

While some measures have been adopted in an effort to harmonize legal differences, there are no provisions for the formation of EC-wide corporations. The one exception to this was the adoption of a regulation in 1985 for European Economic Groupings. This regulation allows firms in different EC countries to join forces on specific projects in a manner analogous to joint ventures. Little progress has been made in the area of intellectual property.

**Capital mobility.** The term *capital mobility* refers to the integration of financial markets—the free movement of assets across member states. According to the Treaty of Rome, the document that established the EC, all restrictions on capital movements between member countries are to be phased out progressively. The treaty does allow countries to introduce temporary “protective measures” in the event of disturbances in the capital market, such as weaknesses in a currency or underlying problems with economic policies. Progress in deregulating capital movement has been mixed. While some countries allow virtually unrestricted capital movement, others maintain high barriers.

The white paper lists three outcomes from improving capital mobility: increase the effectiveness of financial intermediaries, maintain monetary stability, and improve the allocation of savings. In 1987, in its most dramatic directive passed to date, the Commission submitted a broad package designed to eliminate all controls on capital movements, including short-term monetary instruments, personal bank accounts, and certain types of loans.<sup>6</sup>

<sup>3</sup> For a detailed summary of the white paper proposals, see Calingaert (1988, 20–27, 38–64).

<sup>4</sup> Cecchini (1988, 8).

<sup>5</sup> Calingaert (1988, 25).

<sup>6</sup> Cooper (1989, 334).

**Indirect taxation schemes.** According to the Commission, differences in indirect tax regimes across member countries are among the most difficult obstacles to reaching the 1992 goals. Taxation is one of the few areas that requires unanimous consent among member countries.

The white paper addresses two main forms of indirect taxes: value-added taxes and excise taxes. The Commission has suggested that members agree on minimum indirect tax rates. Members would then be free to set higher rates, if they are willing to accept the consequence that goods will be purchased in areas with lower tax schemes.

Similar concerns have been raised about withholding taxes on interest and dividends. As capital controls are eliminated, individuals will be free to avoid taxes by maintaining their assets in countries with lower tax rates. The Commission proposed a uniform withholding tax. In early 1989, however, Britain and Luxembourg expressed concern about having any withholding by the source country. As a result, this issue remains unresolved.

**Services.** Even though the service sector has been playing an ever-increasing role in the European economy, both in absolute and relative terms, it remains highly regulated. Trade in financial services has become particularly complicated due to rapid technological change. Because of disparities among regulatory regimes, prices for financial services vary by as much as 50 percent among member countries. As a result, the white paper focuses much attention on this sector. According to a recent EC study, the estimated gain from integration of financial services would be \$26 billion.<sup>7</sup>

The Commission has made the following general recommendations for the integration of financial services: deregulation that would allow financial institutions to increase the geographic scope of their operations, harmonization of member governments' standards, mutual recognition of other member government standards, and control and supervision of financial services by the country in which the firm is based for all of its EC operations, including those in other member countries.

**Technical regulations.** The disparity between technical regulations and standards throughout the EC is high on businesses' lists of intra-EC trade problems. More than 100,000 different industrial standards and regulations currently

exist.<sup>8</sup> These differences motivate firms to produce for a narrow domestic market rather than a Europe-wide market. Unless these regulations and standards become more unified, firms will be unable to exploit the economies of scale they need to be competitive in the global marketplace.

The previous system of regulations and standards proved inadequate, so the white paper has proposed a new approach. Only "essential requirements" would be established on an EC-wide level under this approach. These essential requirements cover most regulations, including those addressing health, safety, and consumer and environment protection, and they go a long way toward unifying standards. As long as member countries conform to these requirements, they will be free to establish additional standards of their own.

**Public procurement.** Although trade in the private sector has expanded greatly over the past 30 years, the public sector has remained very protectionist. In 1987, it was estimated that only about 2 percent of public contracts are awarded to companies in any foreign country.<sup>9</sup>

Nationalistic public procurement policies have created massive inefficiencies. As a result, the white paper proposes more open procedures for awarding contracts to currently excluded markets. The white paper also proposes a legal framework that would allow companies leverage to assert their rights. The Commission has estimated that the savings from opening the public procurement market would total \$21 billion.<sup>10</sup>

The proposals suggested by the white paper are quite comprehensive. Despite this, the Commission has made an effort to maintain the program as an inseparable whole. If the European countries were to separate the many proposals into parts, the Commission argues, the integrity of the program would be weakened. Consequently, the Commission has not set priorities on these proposals. Of these proposals, however, four in

<sup>7</sup> Calingaert (1988, 25).

<sup>8</sup> Council of Economic Advisers (1990, 251).

<sup>9</sup> Calingaert (1988, 26-27).

<sup>10</sup> Calingaert (1988, 27).



particular contribute the most to the objective of a unified Europe: elimination of border controls, opening of public procurement, harmonization of technical standards and regulations, and liberalization of capital movements and related financial services. These four proposals are discussed most often in literature when measuring the gains to European unification.

### Conceptualizing the overall gains to Europe

The potential gains to the EC from removing the barriers listed above are derived from three types of cost savings: the immediate benefits from removal of the barriers, the medium-term gains from enabling firms to become more efficient and exploit economies of scale, and the dynamic gains from technological improvements as the economy expands. Studies suggest that the medium-term and dynamic gains are greater than the immediate benefits from integration.

The mechanism through which integration affects a particular industry is as follows. Removal of trade impediments in the industry is a positive supply shock. Dismantling internal barriers reduces costs for European companies trading with other EC countries. The price of the commodity declines as competition increases and firms exploit economies of scale. Competition among firms also increases investment. The declining price of the good increases sales and employment for that industry. Thus, removal of trade impediments causes particular industries to expand. At the same time, other sectors contract as resources shift into the newly liberalized industries.

Whether this new pattern of production and trade leads to improvement in global welfare depends on whether unification leads to trade creation or trade diversion. As trade barriers are reduced among EC countries, intra-EC trade will increase. If this increased trade within the EC means that countries purchase more goods from the most efficient producers, then trade creation will have occurred. Trade diversion occurs when changes in regulatory regimes divert trade from more efficient to less efficient producers. This phe-

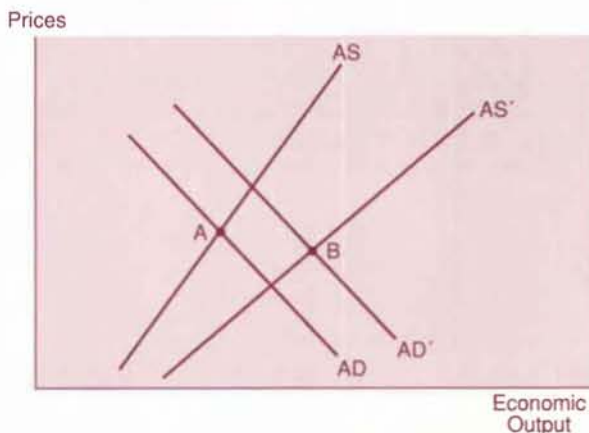
nomenon may benefit EC producers, but, from a global perspective, it may generate a system of disincentives that reduces world economic welfare.

As an example of trade diversion, suppose that the world's most efficient producer of some good is located in the United States and sells its product to French buyers. Moreover, suppose that a higher-cost producer is located in Italy, but dismantling of intra-EC barriers means that this producer becomes the lowest-price seller to the French. If no trade barriers existed, both within and outside the EC, then the U.S. firm would continue to be the lowest-price producer for the French. The combination of high external EC trade barriers and the removal of intra-EC barriers, however, makes the delivered price to the French buyers lowest for the Italian product.

In this hypothetical example, unification leads to a decrease in global welfare if the loss from switching to the less efficient Italian producer outweighs the gain from removing intra-EC trade barriers. The way in which European unification affects the United States also depends on whether unification results in trade creation or trade diversion (see the box titled "How Will Europe 1992 Affect the United States?").

Figure 1 shows the effects of the dismantling of barriers on aggregate demand and supply.<sup>11</sup> The economy begins at an initial equilibrium point A. Removal of intra-EC trade impediments

Figure 1  
The Effects of Unification on European Aggregate Demand and Supply



<sup>11</sup> Dornbusch (1989, 344-45).



## How Will Europe 1992 Affect the United States?

One of the first questions that Americans ask when considering European unification is, How will this affect us? After all, the United States has a sizeable stake in the European Community. U.S. exports of goods and services to the EC totaled \$160 billion in 1989. This figure is almost 50 percent higher than trade with Canada, the largest single-country trading partner for the United States.<sup>1</sup> American firms also have a physical presence in the EC. In 1988, U.S. foreign direct investment in the EC was \$127 billion, about 40 percent of all U.S. foreign direct investment.<sup>2</sup>

European unification offers both opportunities and threats to U.S. industry. First, whether the United States benefits or loses depends on whether European unification leads to trade creation or trade diversion for U.S. export goods. It is generally believed that removing internal European barriers will lead to some trade diversion.<sup>3</sup> Emerson, and others (1988) estimate that imports from outside Europe will decrease between 7.9 percent and 10.3 percent.<sup>4</sup> For the United States, this will mean a drop in exports to Europe. If this decrease in European imports falls evenly across all sectors, then U.S. exports should fall between 2.1 percent and 2.7 percent, because U.S. exports to Europe in 1989 were 26.4 percent of all U.S. exports.<sup>5</sup>

Another potentially detrimental effect on the United States will occur if Europe imposes greater external barriers to trade with countries outside the EC. The threat of greater protection is strongest in several specific areas. First is the area of public procurement. Although governments might be willing to

open access to public procurement to neighboring EC countries, they may not be willing to do this with countries outside the EC, such as the United States. There may be pressure to award contracts to other European companies rather than to U.S. companies. Thus, contracts that previously would have been awarded to an American firm will be awarded to a company in another member country.

Another area in which protection is likely to increase is health and safety standards. As the EC harmonizes individual country health and safety regulations, standards are bound to increase in some countries. The increasing standards may or may not affect the United States. If it is the case that some goods produced in the United States face already higher domestic health and safety standards, then the increase in European standards will have no effect on the United States. In the case of goods produced according to current lower standards, however, rising standards will increase costs for U.S. firms.

In sectors exhibiting scale economies, increased market concentration could cause plant closings. Communities experiencing new unemployment may invoke pressure on the Commission to increase protection. Although observers fear a "Fortress Europe," no overall pattern of EC behavior toward outside countries has emerged.

Reduced barriers to trade within Europe will benefit U.S. firms conducting business in the EC. Costs to these U.S. firms will decline from the removal of internal barriers, just as costs to European firms will decrease. Be-

*(Continued on the next page)*

increases aggregate demand as goods within the EC become cheaper. Increased profitability raises investment. Aggregate demand shifts from AD to AD'. Productivity increases as firms exploit economies of scale and become more competitive. Aggregate supply shifts from AS to AS'. The

economy moves from the original equilibrium at point A to a new equilibrium at point B. Aggregate output in the economy expands.

Overall, Europe has a great deal to gain by becoming a unified market. Current barriers to trade in the EC distort prices and lead to ineffi-



## How Will Europe 1992 Affect the United States?—Continued

cause defining a product's country of origin is becoming more and more difficult, American subsidiaries in the EC will most likely receive the same treatment as European firms. U.S. firms will be able to use one country as a base and develop an EC-wide network for selling their products, reducing both transportation and capital costs. Conflicting and overlapping regulations will no longer hamper production and trade for U.S. industries in the EC.

Overall, the net effect of Europe 1992 on the United States is still unclear. Much of this outcome depends on how capable U.S. firms are in taking advantage of the increased opportunities that Europe 1992 will offer. A recent article by Robert Lipsey (1990) suggests that large American firms are already well established within Europe. Considerable anecdotal evidence supports this view.

For example, in the car market, although Volkswagen, Fiat, Peugeot, and Renault are all strong in their domestic markets, none has the Europe-wide strength of General Motors

or Ford. The same case holds for American computer companies, such as IBM, Digital Equipment, and Unisys.<sup>6</sup> Hewlett-Packard also has more broad-based sales worldwide and within the EC than its European competitors.<sup>7</sup> As Lipsey notes, some U.S. companies are better positioned to take advantage of the unified market than most of their European counterparts.

<sup>1</sup> Bach (1990, 60).

<sup>2</sup> Scholl (1989, 46).

<sup>3</sup> Cooper (1989, 331), and Dornbusch (1989, 353).

<sup>4</sup> Emerson, and others (1988, 238-41).

<sup>5</sup> Bach (1990, 48, 60).

<sup>6</sup> The Economist (1989c, 74).

<sup>7</sup> The Economist (1989b, 57).

ciencies. Removal of intra-EC barriers increases the demand for European goods. Firms expand their market from a single country to the entire community, allowing them to exploit economies of scale. Greater competition among EC firms causes increased profitability and investment, which increases aggregate supply.

### Estimates of the overall gains to Europe

Estimates of the economic expansion in Europe resulting from unification range from as small as 0.5 percent of gross domestic product (GDP) to as large as 35 percent. None of the

models estimating the effects of Europe 1992, however, fully consider all related events. All are partial equilibrium models. Accordingly, despite the effort that has been devoted to questions about the impact of Europe 1992, none of it is likely to result in accurate conclusions. Nevertheless, these models offer important perspectives on the process of expansion in the wake of a positive regulatory shock to the multinational economic system.

Among the studies of gains from Europe 1992, the most widely cited was conducted for the Commission under the direction of Paolo Cecchini (1988).<sup>12</sup> The Cecchini report examines the direct gains of the initial supply-side shock from the removal of barriers and the indirect gains from firms' exploitation of scale economies and increased firm efficiency.

To estimate the direct gains, the Cecchini report quantifies the benefits from elimination of

<sup>12</sup> Emerson, and others (1988) provide a detailed description of the Cecchini study.



Table 1  
**Average Estimated Macroeconomic Gains  
 from European Unification**

Barrier	Real GDP	Consumer Prices	Employment (in thousands)
Border Controls	.4	-1.0	200
Public Procurement	.5	-1.4	350
Financial Services	1.5	-1.4	400
Supply-Side Effects	2.1	-2.3	850
Total	4.5	-6.1	1,800

SOURCE: Cecchini (1988), Table 10.1, 98.

border controls, differences in technical standards, public procurement restrictions, and regulations in services. These benefits are calculated using individual industry studies in seven EC countries. These estimates are added together across industries, assuming that the remaining five EC countries will gain in proportion to their GDP. In this sense, these are partial equilibrium estimates because the Cecchini report does not consider changes in relative prices.

Table 1 lists the estimated macroeconomic gains to the EC from elimination of trade barriers. Note that the estimated increase in overall real GDP is 4.5 percent, while prices should decline 6.1 percent. Employment is estimated to increase by 1.8 million. The Cecchini report further examines the benefits from unification in the case of increased government spending. Expansionary fiscal policies would boost real GDP growth up to 7.5 percent, and prices would decline by 4.3 percent.<sup>15</sup>

A more recent study by Richard Baldwin (1989) suggests that the Cecchini report estimates of the increase in GDP are too low. Baldwin argues that the Cecchini report makes no allowance for the dynamic gains from European unification, such as the rise in technological progress due to a permanent increase in the size of the market.

An important difference between these two

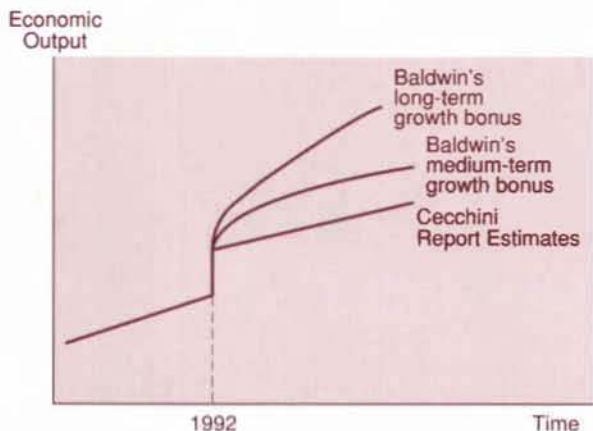
studies is their treatment of investment and its effects on the capital stock. While Cecchini estimates growth effects for a given capital stock, Baldwin estimates a medium-term growth bonus from the effects of scale economies on a growing capital stock. Baldwin argues that as the scale of economic activity increases, the return to capital rises, creating a greater incentive for investment. Output will rise again, motivating further increases in investment. As the capital stock increases, however, an increasing portion of total investment replaces depreciating capital. Consequently, the economy eventually settles down to a new stable level of capital growth. This medium-term growth bonus is estimated to be between 0.6 percent and 8 percent of GDP.

Baldwin also estimates a long-term growth bonus based on assumptions of a theoretical model by Paul Romer. According to Romer, if the scale effects are large enough, then capital can accumulate indefinitely.<sup>16</sup> An increase in the EC's rate of investment may permanently increase its growth

<sup>15</sup> Cecchini (1988, 100).

<sup>16</sup> In this case, the marginal product of capital does not diminish.

Figure 2  
Estimates of the Benefits to Europe  
from Unification



rate, as shown in Figure 2.<sup>15</sup> Baldwin estimates that this permanent increase in growth will be between 0.3 percent and 0.8 percent. Adding up the output effects, Baldwin concludes that unification will lead to an equivalent one-time increase in GDP of between 11 percent and 35 percent.<sup>16</sup>

Some economists, on the other hand, suggest that Cecchini's growth estimates are actually too large. In a recent study, Merton Peck (1989) argues that the Cecchini report overestimates the increase in output by a factor of two or three. Peck arrives at this conclusion in a rather arbitrary manner, however. Peck compares the hypothesized growth in Europe from the elimination of tariffs on industrial products in 1968, estimated by Dennis Swann (1984), with the current unification effort.

Swann finds that elimination of tariffs on

industrial products increased gross national product (GNP) by 1 percent. Peck concludes, rather arbitrarily, that because the proposed changes of the white paper are more extensive, the micro-economic gains should be about 2 percent of GDP. The arbitrariness of Peck's conclusion is even more obvious because Swann's growth estimate is small because trade composed such a minor proportion of the EC's GNP in 1968.<sup>17</sup> International trade has played an increasing role in the EC economy since that time, however. Exports and imports composed about 30 percent of GDP in the EC in 1968 and reached 50 percent by 1989.

The results of a recent study by Data Resources, Inc. (DRI) lend some credibility to Peck's view that the Cecchini estimates are too large. DRI's conclusions are also less favorable than those of the Cecchini report. This study estimates gains in GDP of about 0.5 percent by 1992. According to DRI, employment should increase by 300,000 by 1995, one-sixth the size of the Cecchini estimate. Unfortunately, neither the DRI analysis nor the model that supports it is available to the public because it was prepared for DRI's clients.<sup>18</sup>

### Distributional effects within Europe

The gains to Europe from unification—regardless of size—will not be distributed evenly across the EC. Because of regional disparities, some areas will benefit more than others. Some countries may actually lose employment or industries, as individuals and firms move in search of higher paying jobs or proximity to markets. Countries in the periphery of Europe are likely to receive the smallest benefits from European unification, and they may actually lose in some cases. If these countries become discouraged, the process of unification may slow or even stop.

Many different economic variables will determine which areas will be the greatest winners from unification and which areas might incur problems. A recent article in *The Economist* (1990b) ranks the EC-member countries by estimated growth in the 1990s. This ranking includes the effects of Europe 1992, German unification, and economic reforms in Eastern Europe. Table 2 lists the economic variables that will determine the pattern of growth of EC-member countries from Europe 1992.<sup>19</sup> *The Economist* ranking,

<sup>15</sup> The Economist (1989a) provides a nice summary of the Baldwin study and compares his growth estimates with Cecchini's, as shown in Figure 2.

<sup>16</sup> Baldwin (1989, 265).

<sup>17</sup> Swann (1984, 118).

<sup>18</sup> This study is described in Calingaert (1988, 67).

<sup>19</sup> Data are available for eleven of the twelve EC-member countries. Luxembourg has been excluded from the table because data were not available.



**Table 2**  
**Variables Affecting Which Member States Will Gain**  
**from European Unification**

	Hourly Labor Costs	Inflation (percent)	Total Exports	Net Exports of Capital Goods (as a percentage of GDP)	Current Account
West Germany	100.0	2.3	32.6	3.9	5.4
Denmark	81.7	3.0	34.1	.0	-1.1
Netherlands	81.4	2.1	54.8	-1.6	1.9
Belgium	79.3	3.2	69.0	-2.2	2.2
Italy	74.6	5.8	18.1	1.0	-1.4
France	68.1	3.2	21.5	-.3	-.4
Britain	59.5	9.4	23.3	.2	-3.4
Ireland	55.7	4.2	72.0	6.3	1.4
Spain	43.0	7.0	19.5	*	-3.8
Greece	29.1	17.8	24.4	*	4.7
Portugal	18.1	12.8	33.0	*	-3.1

\* Net importers

NOTE: These data are the latest available, except the current account, which is a 1990 forecast.  
 The data refer to West Germany before unification with East Germany.

SOURCE: *The Economist* (1990b, 72).

which also takes into account exports to West Germany as a share of total exports and exports to Eastern Europe as a share of total exports, found West Germany to be the greatest winner in the 1990s. Spain will be the country with the lowest growth rates in the 1990s, according to the analysis.

According to *The Economist*, with increased trade and capital flows, investment in labor-intensive industries should rush to areas with the lowest wages. Countries that are net exporters of capital goods, such as West Germany, Ireland, and Italy, are well positioned to take advantage of this increase in investment. On the down side, countries with high inflation rates (Portugal and Greece) and countries with large current account deficits (Greece, Spain, and Britain) may be facing supply constraints. These countries will be less likely to increase production immediately with the expanded marketplace.

A rough tally of Table 2 suggests that the

countries least capable of taking advantage of the gains offered from unification are Britain, Greece, Portugal, and Spain—countries located in the periphery of Europe. West Germany stands out as the country likely to benefit most from unification.

One of the critical issues is whether unification will exacerbate currently existing regional disparities.<sup>20</sup> Iain Begg (1990) argues that regional disparities will increase with unification, particularly with respect to labor characteristics. In general, wage rates are lowest in the periphery of Europe. As Table 2 shows, Portugal, Greece, and Spain have the lowest wage rates, while West Germany, Denmark, and the Netherlands have the highest wages in the EC. Wages in Portugal are

<sup>20</sup> See Calingaert (1988, 68-70), Begg (1990), and Bean, and others (1990, 14-16) for more detailed discussions of this issue.

less than one-fifth the wages in West Germany. One important reason for these wage disparities is that wages reflect differing skill levels.

Another important reason for the wage disparities is that a combination of demographic pressures and impediments to labor mobility have caused high unemployment rates in the periphery. Wages for a given skill level, therefore, are lower in the periphery than in the core. In the past, migration of unskilled labor has alleviated some, but not all, of this imbalance.

The white paper proposals, however, concentrate on increasing the mobility of skilled labor. Begg argues that the increased mobility of skilled, professional, and managerial workers may cause the peripheral regions to lose skilled labor, increasing the disparity in average skill levels across countries.

Increased firm mobility also affects the distribution of gains from European unification. Begg argues that firms subject to increasing returns to scale will move to countries with larger domestic markets. A pattern will emerge in which firms subject to increasing returns move to central locations, while less dynamic industries remain in the periphery. As the concentration of production and distribution facilities increases in the core, the gains from scale economies and proximity to markets will offset firms' cost of higher wages and congestion.

Begg concludes that the pattern of gains from European unification favor the core regions. This pattern results from the general fact that the past economic performance of the periphery identifies these areas as relatively uncompetitive. Thus, the competitively weak countries will gain the least, and perhaps lose, from EC integration.

## Conclusion

The EC has much to gain by becoming a unified market by the end of 1992. The barriers to trade that currently exist in Europe distort markets and lead to inefficiencies in production. By removing these restrictions, the EC has the opportu-

nity to invigorate its economy and improve its position in the world economy.

The removal of intra-EC trade impediments decreases costs directly. As firms expand their markets, they become more competitive and exploit scale economies. Costs decrease further. Declining costs translate into falling prices and increasing demand. Increased profitability raises investment. This stimulates growth and leads to greater investment and further growth.

On the other hand, even though removal of intra-EC trade barriers will lead to greater efficiencies in some markets, it may cause new inefficiencies in other markets. If the EC maintains its high external trade barriers, or perhaps increases them, unification may lead to trade diversion. Countries will switch from purchasing goods from the most efficient producers outside the EC to purchasing these goods from less efficient producers inside the EC. In this case, the removal of intra-EC trade restrictions allow external-EC trade barriers to distort markets.

One question remains unanswered: Will Europe reach its goal and become a unified market by 1992? Of the approximate 300 proposals set forth in the white paper in 1985, the Commission had begun negotiations on 60 percent of them by July 1990.<sup>21</sup> Only 121 of these had been formally adopted at that time. Little progress has been made in the areas of liberalizing the mobility of people and unifying indirect taxation schemes, health standards, and price supports set by the Common Agricultural Policy. These areas will not likely be resolved by the end of 1992.<sup>22</sup>

Europe 1992 is not an event; it is an ongoing process. Although the EC may not meet all the goals set forth in the white paper by the end of 1992, it will have made progress in liberalizing trade. Success in removing barriers will be greater in some areas—the areas with less political friction—than in others. This process of liberalization will continue beyond 1992. Regardless, the European Community of 1992 will be considerably more integrated than that of 1985.

<sup>21</sup> *The Economist* (1990a, S1-S3).

<sup>22</sup> *Cooper* (1989, 334-35), and *Fieleke* (1989, 25).



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