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Economic Potential of Western Europe for War

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ECONOMIC POTENTIAL OF WESTERN EUROPE FOR WAR

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Professor Max F. Millikan

Admiral McCormick and Gentlemen:

I face something of a dilemma this morning. My problem is how to limit the scope of my remarks to things that I know something about. I know a little about the European economies, but I am almost completely ignorant as to current European military strength, and I am also quite ignorant on questions of military strategy. Therefore, my problem is to try to identify a set of military problems to which the analysis of the economies of the countries which I want to talk about is relevant.

This is not as easy a job as it looks to be at first-hand because as an economist I share the conviction of the late great Lord Keynes, one of the world's greatest economists, that economics is not the most important of the factors that effect human behavior. Whereas I certainly would not want to contradict the Captain who introduced me and contend that economic potential is not an important piece of war potential, I think that economists generally — and, perhaps even more, non-economists — may have a tendency to exaggerate how much you can learn about military strength from a look at strictly economic factors.

Let me illustrate what I have in mind by describing a particular type of conflict in which I would assert that economic factors would play almost no role. Suppose that war starts tomorrow. Suppose that this is an inter-continental atomic war and that, unlike almost any previous war we can think of in history, this one comes to a conclusion in, say, three or four weeks. There

is an extraordinary degree of devastation everywhere and a general recognition that there is no point in going on with the destruction.

For the analysis of this kind of a war, starting tomorrow, I would say that economics is almost totally irrelevant. For the analysis of this kind of war what matters is military strength in being as of the present moment. As I have already indicated, this is something which I know little or nothing about and it certainly does not belong in a talk on the *Economic Potential of Western Europe For War.*

It seems to me that this kind of a war is not at all inconceivable. The significance of the over-all economic capability of a nation may have been increased in some ways by the development of atomic and nuclear weapons, but in other ways it may have been reduced very sharply. In so far as the conflict is confined to a relatively brief interchange of atomic blows, the outcome of the war will be determined in the first instance by the military strength in being at its beginning.

Suppose now that we change our assumption and assume that war starts after, say, five or ten years but that, again, it lasts only very briefly. If there were to be no change between now and the outbreak of war in military strength in being, the answer would still be the same: economics would not be relevant. Of course, economics could help us a great deal in trying to decide what the possibilities were for the development of very much greater military strength by the time that hostilities broke out. Economics could not tell us, however, whether such military strength would be developed. It could tell us only what certain of the limits might be to the development of military potential in the intervening period. I will say a little, but not a great deal, about the economic potential of Western Europe to get ready for war.

What I really want to concentrate upon is a third type of case in which war starts any time — tomorrow, or ten years hence

—but it lasts, let us say, two or more years. In this kind of a conflict the economic limits to military potential *may* be the crucial limits. Morale and political questions may be substantially more important or the effectiveness and efficiency of the military operations of both sides may be the critical factor. But this is the situation in which it is most likely that economic potential will become an important limit to the capacity to wage war.

I would like to distinguish between two different ways in which economic considerations may become important because I would like to concentrate very largely on one of them here. In the first place, it is important to consider the capacity of a country to continue to exist in the face of atomic attack these days. In other words, there is a very important set of problems which relates to the vulnerability of the civilian economy to military attack from the other side, and, particularly, to atomic attack. The weapons that have been developed in recent years have had as their key characteristic that they will almost certainly put in the hands of an attacker the capacity to inflict vastly greater damage on the civilian economy of the enemy nation than any weapons which we have had in the past.

The other aspect of economic war potential is the capacity of a country to maintain and supply modern forces in being in the face of attrition and through time. It is this problem to which I want to devote my attention chiefly this morning in my remarks on Western Europe — partly because we would have to get much more deeply into military matters if we were to discuss the vulnerability question than I feel competent to do.

Now that I have made my graceful bow to the truth that economics is not everything, I will feel free for the balance of my remarks to flaunt my professional bias quite unashamedly and talk exclusively about economic problems.

Of course, to begin with, we face the question of how we are going to go about setting up some kind of measure of the

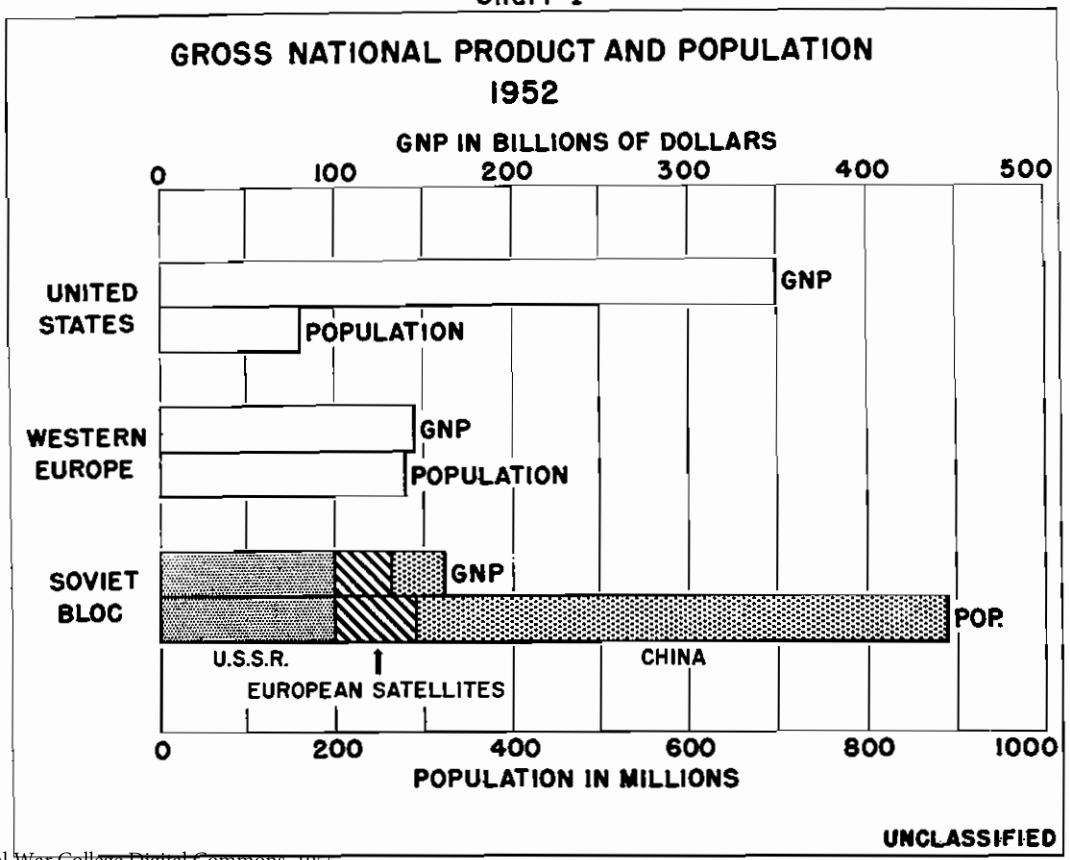
economic capability of an area to support military activity. I am not going to engage in a long theoretical discussion of this point (I gather that some of you have been studying the problem of how to define economic capabilities for war with one or two of my M. I. T. colleagues), but I am going to plunge right into a discussion of certain alternative measures that we can use with respect to Western Europe.

I would like to offer one statistical caution before I begin. Any conclusion which I state during the course of these remarks which would be altered if any of the figures that I use were either 20% higher or 20% lower is a conclusion of which you ought to be deeply suspicious. In other words, in the kinds of measures we will be talking about margins of 15% or 20% of error are to be expected. All that we are trying to get at is general ranges of magnitude and relatively small differences are meaningless because the figures are not that good, either in concept or in the statistical data available for them.

I would like to start with the measure which first springs to mind when an economist tries to decide how well off a country is, broadly speaking, in economic terms. You are probably all familiar with this measure in a general way. It is called the *gross national product* and it is one version of a series or measures. Another one is *national income*, which comes to approximately the same thing in most cases. Gross national product is an economist's measure of the total value of the output of an economy in a given period of time, normally a year. I would like to show you a chart which compares estimates of the gross national product (shown as the upper of the paired bars on this chart) of the United States, Western Europe and the Soviet Bloc. Disregard the lower bars for the moment.

The gross national product of the United States in 1952 was approximately 350 billion dollars. The gross national product of Western Europe was in the neighborhood of 150 billion dollars. The gross national product of the Soviet Bloc, including

Chart 1



China, the U. S. S. R., and the European satellites, can be estimated anywhere between 100 billion (which is probably a lower limit for the Bloc as a whole) and perhaps 150 billion (which is probably an upper limit for the Bloc as a whole). Incidentally, for the purposes of this chart, I am excluding from Western Europe, Greece, Turkey and Yugoslavia. I am including some countries that are not in the North Atlantic Alliance — Spain, Portugal, all of Scandanavia, West Germany and Austria — since it seems probable that the resources of that entire area would be available in one way or another in the event of major hostilities.

Initially, the interesting thing to notice about this set of figures is that already the Soviet Bloc has grown sufficiently in economic potential, as measured by gross national product, to be approximately equal to Western Europe. It actually shows in these figures as slightly greater than Western Europe. But, as I say, this is not a significant difference in the light of the statistical variation in the estimates.

If you exclude China, in particular, it is quite probable that the gross product of the Soviet Bloc, including only the Eastern European satellites and the U. S. S. R., was still in 1952 somewhat below that of Western Europe. It is very doubtful whether it continues to be below that of Western Europe in 1954, and, if growth rates continue at present trends, it certainly will be well above in another three or four years.

Now a brief look at the composition of this Western European gross national product by countries. Very roughly, a fifth of this total Western European economic output is produced by West Germany and Austria; approximately another fifth is produced by France; a little more than a fifth is produced by the United Kingdom — some 36 billion out of a total of 150 billion. In other words, well over three-fifths is supplied by France, the U. K., West Germany and Austria. Something like another fifth

is then supplied by the Low Countries — Belgium, the Netherlands, Luxembourg, Switzerland and Scandanavia. Substantially less than a fifth, or about one-seventh, is supplied by the Southern European countries, Italy and the Iberian Peninsula.

Is this really a measure of economic war potential which is of any great service to us? I would contend that it is very useful to know that the total volume of output of Western Europe is of roughly the same order of magnitude as that of the Soviet Union; also, to know that the total output of the United States is better than twice that of either of the other two groups of countries.

I think it is also useful to note that should Western Europe become a part of the Soviet Bloc, and should the Soviet Bloc be able to exploit Western European resources as effectively as the Western Europeans exploit them, we would then be faced with a coalition which would very nearly equal ourselves in terms of this particular measure of the aggregate value of all output in the society.

Of course if we get into a war situation, this gross national product will change. That is one of the reasons why this is perhaps an inadequate measure. In the United States, for example, we were able to increase our gross national product at the peak of the war in real terms by somewhere between 10% and 15% above what it would have been had the normal trends of peacetime gross national product persisted. We did this by bringing women into the labor force, by working longer hours, and by reducing unemployment to very much lower levels than are normally to be found in a peacetime economy. Western Europe could do this, too. There is undoubtedly more slack in the Western European economy at the present time than there is in the Soviet economy and probably a greater percentage of slack than there was in the U. S. economy in 1940 or 1941. Nonetheless, it would be my guess that the bar beside Western Europe would not go up by more than 10% or 15% at the outside if her resources

(SEE CHART NO. 1)

were to be more fully used under the pressure of a wartime emergency. The over-all picture is not very much influenced, but it is influenced a little. Western Europe would look a little better relative to the Soviet Union if it were to make full use of its resources.

The first question that occurs to one in considering whether or not this is a sensible measure is that, in looking at the value of output, we have left out how many people have to be supported by this flow of goods and services. When we introduce people, we find that a double set of considerations comes into play. People, in general, are a mixed blessing from the standpoint of war capabilities. On the one hand, people can be soldiers and in this sense people are a good thing. You have more capabilities if you have more people. On the other hand, people have to be fed. If you have too many people, you may get into a situation where your economic resources are so fully absorbed in the attempt simply to feed them and keep them going that you have very little left over with which to arm the abundance of soldiers that you have.

As soon as you look at the bottom bars, which represent

(SEE CHART NO. 1)

population measured on the scale at the bottom of the chart, you at once see that people are in the opposite sort of ratio to gross national product in these two areas. The United States has much the fewest people of any of these three groupings and the Soviet Bloc has much the most people. However, I would suggest that for purposes of the comparison in which we are currently interested — for the purposes of a focus on Western European economic potential for war — you should disregard the bulk of this bottom bar, the one which represents the population of China. This consists of a little less than 600 million by their own official estimate, a population greater than those of Western Europe and all of the rest of the Soviet Bloc combined. If you add the population of the United States, the whole grouping is

still nearly exceeded by the population of China. That population has only the very small piece of economic output to support it represented by the small square at the end of the upper bar.

China, then, is an extreme case at one end of the spectrum where people are almost certainly very much more of a liability than an asset. China by herself is not an economic asset to the war-making capabilities of the Soviet Union, let us say, against the West. China's manpower is an asset but Chinese national product at the moment is so low that if China's manpower is to fight, the weapons with which they will fight must be supplied by other parts of the Bloc, as they were to a major extent during the whole Korean conflict.

I would therefore suggest that we forget about China when we are considering the comparison of Western Europe's economic potential with the economic potential of the Soviet Bloc because, if anything, China is a drag rather than an asset. This is reflected in the fact that if we divide gross national product by population, and get an indication of total output per man in our various societies, we come out with an almost invisible piece. The Chinese pro-

(SEE CHART NO. 2)

duct per man is somewhere around $50 as against an American product per man (in 1953) of well over $2,000 and an all-Western Europe product per man of about $500, or a little better than that.

Within Western Europe, we again have to make some distinctions because not all of Western Europe would be an asset to a power that was trying to conduct a major war. Broadly speaking, its again pretty clear that the Iberian Peninsula (Spain and Portugal) is an area that cannot do very much more than support its own civilian population in the event of conflict. It might be able to supply a few soldiers, but it certanly could not supply any of the economic sinews of modern war.

The same thing can be said of the southern half of Italy at the present time. Italy ought really to be cut into two pieces

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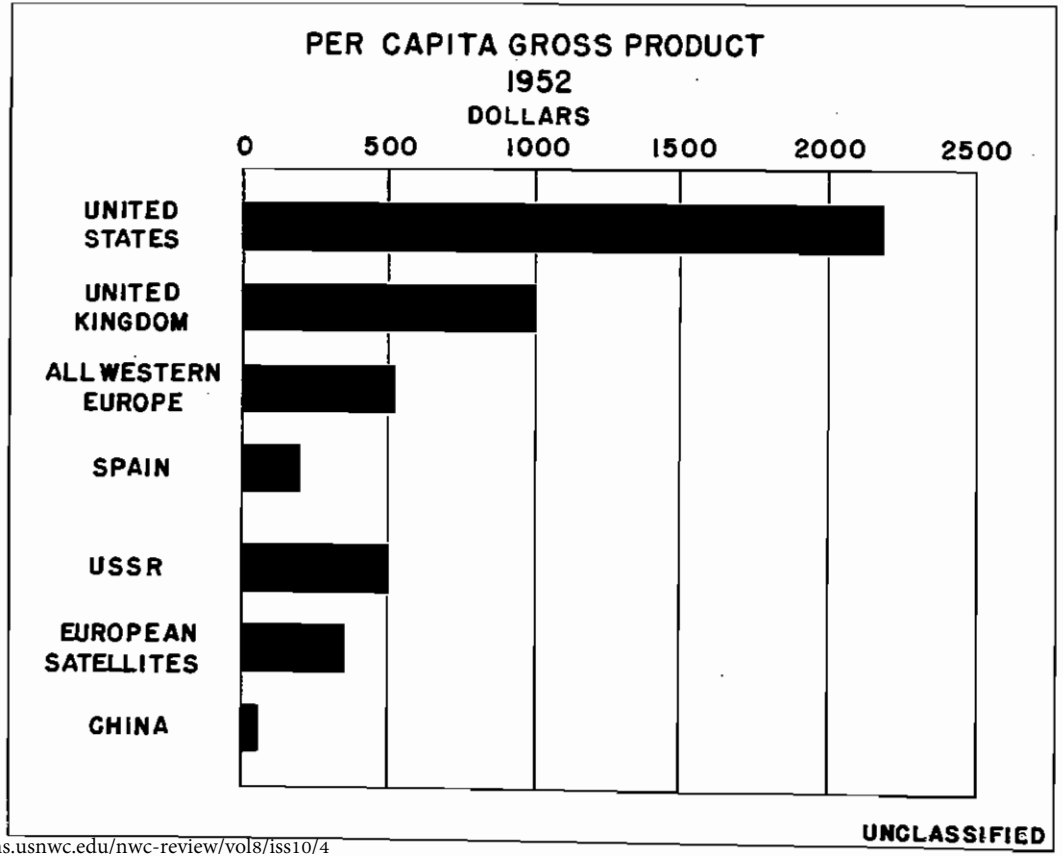
Chart 2


PER CAPITA GROSS PRODUCT
1952
DOLLARS
0
500
1000
1500
2000
2500
UNITED STATES
UNITED KINGDOM
ALL WESTERN EUROPE
SPAIN
USSR
EUROPEAN SATELLITES
CHINA
UNCLASSIFIED

for this purpose because the southern half of Italy is a relatively primitive, agricultural area with a per capita gross product which certainly does not exceed $200 (it is probably somewhat less than that). Likewise, it would probably fall into the category of a net liability.

On the other hand, you have an area like the United Kingdom, with a per capita gross product of a little less than half of our own, where there is certainly a good deal of excess in the gross product over the basic minimum necessary to maintain survival and subsistence. This excess could be diverted to military purposes.

You will note, in the first place, that Western Europe as a whole has a per capita product about the same as the U. S. S. R. In other words, in a comparison of these two areas they march along side by side. The population of the Soviet Bloc (excluding China) and the gross product over-all is about the same as Western Europe. Therefore, since those items are the same, their divisor of course is also the same — the per capita gross product. Actually, if you throw the European satellites in with the U. S. S. R., you get a per capita gross product that is somewhat below that of all of Western Europe because the population is somewhat greater. However, there are much greater variations within the Western European grouping of countries than there are within the Soviet grouping. There are certain countries, like the Iberian Peninsula and southern Italy, which would make very little contribution, and certain other countries whose per capita income is so high that they could make a very substantial one.

It is tempting at this point to engage in a piece of reasoning which would suggest that Western Europe was in fact a good deal better off in terms of capabilities for war than the over-all gross product comparisons would show. It is tempting to divide gross national product into two parts: to say that one part of the total economic output of a society is required to maintain

minimum subsistence for the population of the society, and that above this bare minimum for subsistence the balance of resources might all be regarded as available for military uses.

As an index of the sort of bare minimum to which Western civilization could be forced, we could then take the minimum which rules in the Soviet Union. Something of the order of half of this per capita gross product in the Soviet Union goes into direct personal consumption in the U. S. S. R. In other words, you could roughly split that bar in half. This could be described as the portion of gross national product which goes to civilian

(SEE CHART NO. 1)

subsistence. The balance is available for other purposes, including defense purposes (we will go into what some of those purposes are later on).

It is tempting to say, therefore: "Why don't we take $250 as an index of how far you can squeeze civilian consumption down and still maintain survival?" We would then find that if we squeezed the United Kingdom's civilian sector down to $250 per person, or its equivalent, we would be able to supply three-quarters of the national product for military purposes instead of half, as the U. S. S. R. can do. Of course, the United States would provide a much more dramatic illustration. If we were able to go down to $250 per person per year, we could supply seven-eighths of our total product to the military. This would lead us to the conclusion that the gross product comparison tends to understate the economic capabilities for military action of Western Europe because in certain of the Western European countries there appears to be more fat on the bones.

Unfortunately, in fact, it does not work this way. It is most unlikely that in any of the Western European countries you could reduce civilian consumption to anything like $250 per head where it is not already that low. Of course in the United States, it would be quite inconceivable that we could get our domestic consumption

down anything like that far. This is not only because of political factors and it is not only because of the will of the people, but because of a series of other factors, which I will go into presently at somewhat greater length.

In order to analyze more fully the problem of how much one could squeeze out of the gross product of a country for military purposes, one has to analyze the composition of gross product; that is, the kinds of economic activity that are reflected in these over-all figures. I will state in advance my general conclusion, which, since it is entirely personal to me and might not be agreed with others, I will dignify by the name of "Millikan's Law." This conclusion is that there is an absolute ceiling on the military use of G. N. P. in any country or in any civilization at any time and that that ceiling is in the neighborhood of 50%; that it is probably impossible to reduce the proportion of peacetime gross product devoted to civilian purposes below about 50% of the peacetime gross product. This is a floor, and may very well be quite impossible to get down that low.

Obviously, in China, you cannot reduce the standard of living at all without mass starvation. In fact, there is a certain amount of mass starvation even now at a $50-a-year standard of living. In my view it certainly would be impossible, at present prices in the United States, to get civilian consumption down below something well over $1000 per head. In Western Europe and the United Kingdom, it would be impossible to get civilian consumption down to anything less than well over $500 per head.

Let us consider for a minute what the components of gross national product actually are in a period of peace. The economists usually divides them into three groups, but I am going to divide them into four, splitting one group into two parts: (1) consumption, which is that part of total economic activity that is devoted to food, clothes, housing, recreation, education — all of the things that individuals consume in an economy;

(2) investment, which is not investment in the Wall Street financial sense but investment in the sense that the economy is using its resources to build productive equipment — to build plants, to build machines — to expand its capital resources; (3) governmental services, which can be conceived of as a kind of consumption if you like but which is such a different kind of animal that it probably ought to be described separately as the cost of governmental administration; and (4) while miltary activity, this normally is included as part of government services, but I want to separate military activity from other government activities.

How do these components break down at the present time in Western Europe? Very broadly speaking, something more than two-thirds of the total economic activity of the Western European countries is devoted to consumption in peacetime. It is somewhat lower in Germany and France, for example, than it is in the United Kingdom. In the United Kingdom, consumption probably takes over 70%; in Germany and France, it is probably closer to 65%-68%.

There is a very much wider range of variation in the other three activities. Currently, the United Kingdom has the highest proportion of its total economic activity devoted to defense activities, running somewhere in the neighborhood of 10%, depending upon how you compute it. Of course, Germany has probably the lowest proportion devoted to this category simply because she has not been allowed to devote any more so far. That will rise quite sharply as the new agreements reached at London and Paris go into effect. There are some defense activities in the form of police units and so on in Germany, so that something like 4% of Germany's total product goes into defense at the present time. France is not very much better, with somewhere around 6% of her product devoted to military output.

Investment takes another part of output, which, again, varies widely from country to country. The United Kingdom is

plowing 13%-15% of its resources back in the form of new capital equipment. Germany has a very high rate of investment, with a fifth of her resources currently going into capital for the expansion of her economy. France, similarly (and rather unexpectedly), has quite a high ratio of investment to total gross product.

But if we compare the Western European countries, which have a pattern very similar to that of the United States (currently our consumption rate is a little lower, or about 64%; our defense rate is about 14%; our investment is about 19%; and our non-defense government rate is about 3%), with the Soviet Union, we see that our gross national product comparisons have considerably overstated the economic resources devoted to defense in the West. It is anybody's guess as to the level of consumption in Russia because the figures are so hard to interpret, but the share is down around 50% instead of 65% or 70%. Investment and defense, together, provide a total of in the neighborhood of 40% of the Soviet product. The dividing line between investment and defense expenditures in the Soviet Union is a very narrow one because a tank plant may be listed as a tractor plant; a plant that produces trucks exclusively for military use may be listed as an automobile plant, and so on. Because so much of the investment in the Soviet Union has a distinctly military bias — because so much of the plant and equipment that is produced there is produced with an eye at least to military results as well as to others — not only is her share of investment in defense currently very much larger than that of Western Europe, but that share is much more effectively focused on defense production than is the case in Western Europe.

Of course this does not answer the question of what Western Europe could do about this, but it does tell us what the situation is at the present time. To what degree could military production be expanded in the event of crisis, specifically in the event of war, in Western Europe? I have already given you my conviction that at best, because of the over-all application of Millikan's Law, it could not be expanded to more than 50% of gross

product. But could we get anywhere near that amount? Could we go up from the very low level currently ruling for most of these countries — 6%-10% — to anything substantially higher?

This problem breaks down into two pieces: (1) How much could non-defense activities be squeezed and still maintain the civilian economies in reasonably good shape? (2) Suppose the civilian economies could be squeezed this far, could the released resources be used effectively for military purposes?

Both of these questions require the answer to a prior question: How long a period of time are we talking about? The principal place where civilian production can be squeezed in most of the Western Europe countries is not in consumption, although this can be reduced somewhat, but in the 15%-20% that is going into investment. A large part of the production of new plant and equipment in Germany, in England, in France, and in Austria could be shifted over to much more directly military purposes without reducing current civilian consumption at all and without in the short period running into any serious problems of maintaining the current economy. If, however, this was done over a period of five to ten years, the effects would begin to be serious. Not only would there be failure to replace equipment as it wore out, but there would be failure to increase productivity and to advance economic capabilities.

So, in a sense, Western Europe could secure a big increase in economic capabilities for war in the short run at the sacrifice of long-run growth and of higher economic capabilities in the more distant future. This is a dilemma faced in any analysis of the economic capabilities of a country for war. The economic capabilities for war tomorrow, or over the coming year or two years, are greater the more you cut into the economic capabilties for war in a period farther in the future.

In the United States, during World War II, we cut back our investment, which had been running from 15%-20% of gross

product in normal periods, to a level of around 5% or lower. During the war, we achieved a peak of approximately 40% of our national income or product devoted to strictly military purposes.

Russia, at the peak of the war in 1944, was listing in her official statistics something like 34% (less than ours) of her total product in military activity, but she was also listing an additional 14% in investment at the peak of the war. It is a pretty good guess that a substantial part of that investment was serving military purposes in one way or another. So, we probably ought to look at the Soviet Union as having allocated at the peak of the war roughly half of its national income to defense purposes.

Let us look now at the possible cuts in consumption. The question of how far consumption can be reduced is, of course, in part a political question. I am not a political scientist, so I am not going to talk about this. You will have to get your judgments as to the will and nerve of the Western European Continent and the countries composing it from some one more skilled than I. There are, however, certain strictly economic considerations that come into the problem of how far consumption can be cut. One of the reasons why you cannot follow the line of argument that I gave you earlier, simply assuming that you can cut back consumption everywhere to perhaps $250 per capita because you can do it in the Soviet Union, is that patterns of consumption are very deeply engrained in our whole way of life and in the whole structure of our economy. For example, if people are used to travelling in automobiles, to take a case in point, you cannot simply eliminate automobile transportation because all of the fundamental economic activities of the country assume the availability of automobiles. Where people live, the distribution of their homes with respect to their places of work, and so on, have all been preconditioned by the existence of this particular element in our consumption pattern.

So one of the resistances to the reduction in consumption is the degree to which all economic activities are based on certain kinds of transportation, on the adjustment of heating and clothes to each other, on refrigeration of food, and the like. The fact that a civilization has been developed in England, for example, and in some of the countries on the Continent where clothing and living practices are adapted to the assumption that there is going to be a lot of fuel for heating and where food habits are adapted to certain assumptions about the kinds of food that are going to be available, limits the degree to which you can cut consumption and still maintain productivity of the economy.

There is another factor that works on the opposite side of the fence. In so far as a lot of the services which consumers receive and the services or durable pieces of equipment which they own, that is, are the services of consumers' capital, you can in the short run cut back very sharply the proportion of your production that goes into these durable consumer items. Of course, this was one of the big elements of fat in the U. S. economy during the war. We could cut the output of new automobiles altogether for a few years without cutting the volume of automobile transportation at all significantly.

The percentage of cuts that are possible in consumption in Europe are substantially smaller than in the United States. This is so principally because the share of durable goods in European consumption is very much lower than in American consumption. In other words, there are many fewer things that you could simply stop producing for two or three years for consumers without really affecting consumer welfare or efficiency in Europe. For example: in the United Kingdom, per capita food consumption is about 85% of what it is in the United States. On the other hand, per capita consumption purchases of transportation equipment are only 5% of what they are in the United States. There is not a huge automobile industry that can be turned over rapidly to making tanks and military equipment.

The consumption of household goods — refrigerators, kitchen equipment, and all of that sort of thing — is very much lower in the United Kingdom, being 34% of that of the U. S., as against 85% of the U. S. in food. This means that all of the services that are performed by household equipment in this country that have to be performed in the U. K. by the labor of housewives, domestic servants, or others (or which simply do not get performed) are elements in consumption which they cannot cut back as we could do.

Of course, they have advantages over us in some respects. One of the few types of consumption which is very much higher in a European country in absolute terms than it is in the United States is alchoholic beverages in France. The consumption of alcoholic beverages in France — at U. S. prices — is about three times what it is in the United States per capita. On the other hand, since this is only 2%-3% of the national income, and since in any case a French soldier probably has to have wine to fight properly, not much military advantage could be secured by cuts in this item.

There is one respect in which Europe is in quite a different position from the United States. Europe could, by cutting back on some of her non-durable consumption items — even though she does not consume large volumes of durables — release some resources which would be very valuable in military production. Broadly, this is because it is true of all European countries that a substantial part of their current consumption is paid for by exports of capital goods and equipment, of machinery and other types of durable items. The plants which make these could be converted to the production of war materials and the raw materials they consume, in turn, are also the raw materials that a war program needs. By cutting back on the consumption of food, for example, it would be possible for Europe to save in precisely

those items which would be important for military purposes, although the resources directly devoted to food production are normally not resources that can easily be devoted to military production — land and labor. Europe gets its food to a considerable degree (this is especially true of Great Britain, but it is also true of several of the Continental countries) not by producing it themselves but by producing manufactured goods which they exchange for food. Therefore, by cutting back on their food imports and some of their other soft goods imports they could free resources fairly rapidly for military purposes.

It is possible, in summary, that consumption could be cut back in Western Europe from 65%-75% of gross product to maybe 55%-60% of gross product, but it certainly could not be cut back to anything like the Soviet percentage. The big place where cuts would be possible — and where there is a real potential for expanding military activity — is in investment programs. These can be cut back as far as you like, depending on how long you think you can get by without replacing, modernizing, or expanding plants and equipment.

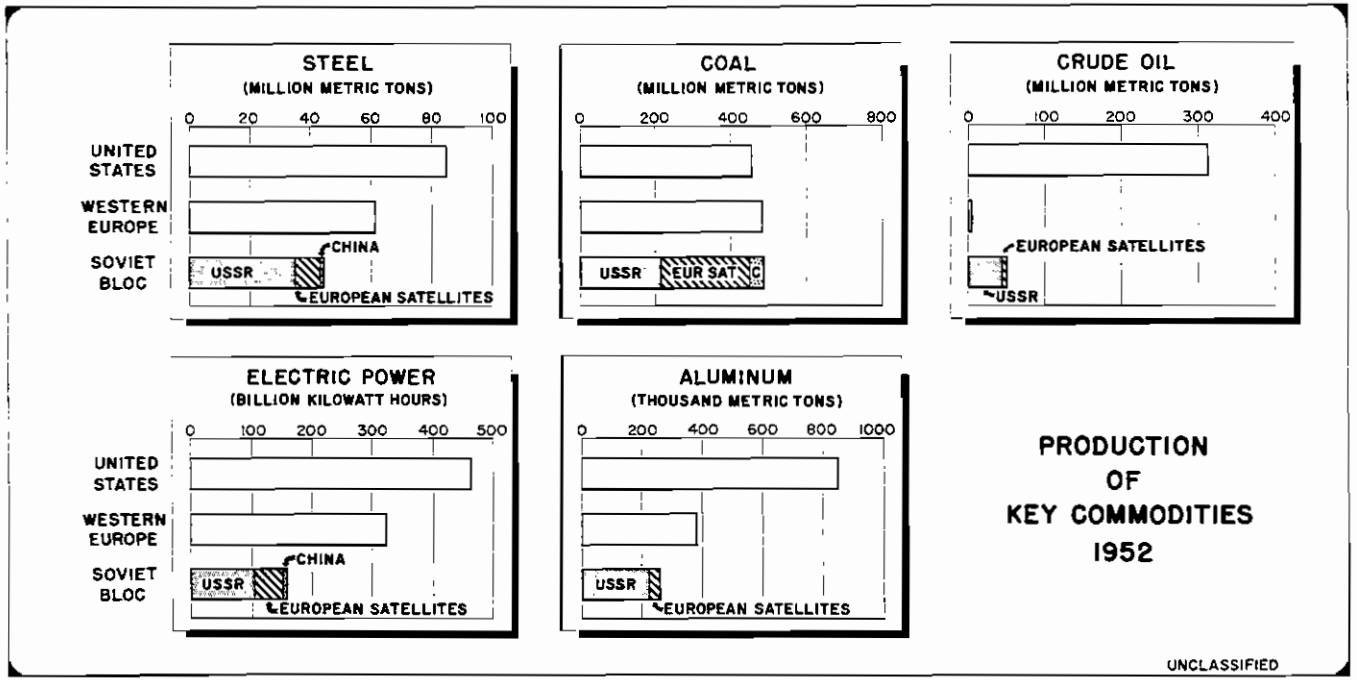
With all of these economic factors in mind, but extracting entirely from political factors, one might make a guess that the proportion of Europe's total economic resources devoted to military purposes could be raised from their present 6%-10% of gross national product to perhaps 30%-35%. If the program were properly handled, it would not be until something like perhaps 35% of total European product devoted to defense were reached that further cuts would begin to be self-defeating because they would interfere with the productivity of the civilian economy.

Now, I would like to show you one more set of charts

(SEE CHART NO. 3)

because we have talked so far entirely in terms of these broad sectors of production and have not looked at specific commodities at

Chart 3


STEEL
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WESTERN EUROPE
SOVIET BLOC
USSR
CHINA
EUROPEAN SATELLITES
COAL
(MILLION METRIC TONS)
0 200 400 600 800
USSR
EUR SAT
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CRUDE OIL
(MILLION METRIC TONS)
0 100 200 300 400
EUROPEAN SATELLITES
USSR
ELECTRIC POWER
(BILLION KILOWATT HOURS)
0 100 200 300 400 500
UNITED STATES
WESTERN EUROPE
SOVIET BLOC
USSR
CHINA
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0 200 400 600 800 1000
USSR
EUROPEAN SATELLITES
PRODUCTION
OF
KEY COMMODITIES
1952
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all. Certainly, in the short run, the question of economic potential for war has to be looked at in terms of the availability of particular commodities and particular production facilities since, in the short run, it is impossible to substitute widely within an economy.

If we look at the picture by commodities, relative to the Soviet Bloc, we see that in a number of key items Europe is better off than the over-all gross product figures would suggest.

For example, Europe is better off in steel, for she still has a very substantially higher steel capacity than the Soviet Bloc.

In coal, Europe is somewhat better off. This Soviet Union coal bar is a little shorter than the Western European coal bar.

In electric power, which of course, is essential to all kinds of military production, Western Europe is very substantially better off than the Soviet Union.

In aluminum, Western Europe is also substantially better off than the Soviet Union.

From the standpoint of economic potential for war, the glaring deficiency of the whole of Western Europe is in basic petroleum supplies, there being almost no crude oil production at all on the Continent of Europe. This would be a very serious weakness if Western Europe were fighting alone. On the other hand, if you throw in the petroleum supplies over which Western European countries currently have control, you come out with a figure very substantially greater than the Soviet Union figure. However, many of these sources of petroleum are militarily highly vulnerable — such as the whole Middle Eastern area — and therefore perhaps cannot be counted upon with very great confidence in the event of hostilities.

By and large, the picture which we get from a look at these specific commodities (and this would not differ much if we

looked at a lot more of them) is to reinforce a bit our judgment that the economic potential of Western Europe for war is probably equal to — perhaps greater than — that of the Soviet Union.

In summary, as of the present day the gross national products are about the same. The Soviet Union could devote a substantially larger fraction of its gross national product to military purposes than could Western Europe. But, on the other hand, Western Europe's resources, because she has engaged in manufacturing predominantly and traded manufactures for her imported raw materials and consumption goods, show some edge over the Soviet Union in the sorts of raw materials and manufacturing areas of the economy which are important to war potential.

I realize that I am over my time, but I want to spend just one minute on a final epilogue because I have talked so far entirely in terms of the present picture. This may give you an undue degree of smug satisfaction about the relative economic capabilities of the East and West and the importance of our allies in this struggle.

This whole picture is changing very rapidly. Over the past few years, the gross product of the Soviet Union has been expanding at somewhere between 5%-7% per year. This is an extraordinarily rapid rate of growth. It is roughly twice the rate of growth of the United States' gross product and it is also roughly twice the rate of growth of the Western European product taken as a whole. Certain Western European countries have shown surprising spurts recently: Germany has been expanding her national product at 5%-6% and France has been doing quite well in recent years, but many of the factors which are responsible for this are somewhat temporary factors. On the whole, if one were to make a guess, projecting present trends, I would say the probabilities would be a Western European rate of growth of maybe 3% a year, or roughly half of the Soviet rate.

It takes only twenty-five years at this rate of growth for the Soviets to achieve a position exactly twice the position of Western Europe in terms of most of the industries that I have been giving you. Therefore, if you are interested not in war tomorrow but in war fifteen or twenty years hence, you must become interested — and very vitally interested — in the growth possibilities of the European economies. The growth possibilities of the European economies, in turn, depend not so much on their resources — for they have the resources and the capabilities for growth — but on problems of administration, problems of morale, and problems of politics.

Having brought the key question around to a point where it is once again outside of my field, it is perhaps appropriate that I should stop.

BIOGRAPHIC SKETCH

Professor Max F. Millikan

Professor Millikan attended Philips Andover Academy, California Institute of Technology and Yale University, where he received his B. S. degree in Physics. He then studied Economics at Cambridge University and received his Ph. D. degree in Economics from Yale University.

From 1938-1942, he was Instructor and Assistant Professor at Yale University. During the next year, he was employed as Senior Business Specialist in the Office of Price Administration. From then until 1949, he was Research Associate at Yale University. During 1942-46, however, he was granted leave to serve with the Government.

Professor Millikan served as principal Economist with the War Shipping Administration during 1942-44; as Assistant Director of the Division of Shipping Requirements, War Shipping Administration, from 1944-46; and as Chief of the Economic Intelligence Branch, Division of Research for Europe, Department of State during 1946. The following year, he held two positions in the Government: Consultant to the House Select Committee on Foreign Aid and Assistant Executive Secretary to the President's Committee on Foreign Aid. He became Consultant to Gordon Gray, Special Assistant to the President, Executive Office of the President, in 1950, also acting as Consultant to the Department of the Air Force during 1949-1950 and Consultant to the Economic Cooperation Administration during 1948-1950.

During 1949-1952, he was Associate Professor of Economics at Massachusetts Institute of Technology, being granted leave from 1951-52 to serve as Assistant Director to the Central Intelligence Agency. Since 1952, he has been Director of the Center for International Studies and Professor of Economics at Massachusetts Institute of Technology.

Professor Millikan has lectured at the National War College, Naval War College and the Industrial College of the Armed Forces.

He is editor and co-author of *Income Stabilization in a Developing Democracy* (1953) and author of articles in *Econometrica* and *American Economic Review*.