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Economic Elements of U.S. War Potential

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ECONOMIC ELEMENTS OF U. S. WAR POTENTIAL

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My topic this morning is "Economic Elements of the U. S. War Potential." As you can imagine, it is a tremendous topic and I am going to have to skim fairly lightly and rapidly over many phases of it. I will talk in fairly general terms and hope that various specific details can be brought out later in the question period. I want to deal with the topic in three major headings and, if there is time, to add one additional topic.

My first of the three headings is "The determinants of maximum overall production potential." The first point I want to make is to dispose of money. In peacetime, the magnitude of what is produced in the aggregate, and for any particular segment of the ecomomy the maximum of a given thing that can be produced, depends upon money demand. Therefore, we think of money as being of tremendous importance to the volume of production. In war time, however, if the country is solidly behind you, there is no problem of appropriations such as you have in peacetime. There is no problem that is really difficult relative to raising the money to buy what has to be produced. The government will provide the demand with money that can come either through taxes, borrowing, or if necessary, various other inflationary means.

Money itself is not a limiting factor in war production—that is something that can be disposed of fairly easily. We do use money, however, as a general measure, and I will keep referring today to a particular magnitude that we call gross national product,

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which is the sum total in value terms of all the goods and services produced in this country. That is the measure we use of the total level of production. It is measured in terms of money because you cannot add tanks, ships, and yards of cloth. We have to have a common denominator, and for this we use money. But as far as I am concerned and from the point of view of this presentation, we can dispose of money.

The real determinants of production come down to the basic and physical factors of production, and I want to deal with each very rapidly. First, the human factor—*labor*. Out of any given population, the labor force actually is a small fraction—less than half. Out of our population today of approximately one hundred forty to one hundred forty-five million people, our labor force is somewhere around sixty to sixty-five million people. Now the magnitude of the labor force depends on the composition of the population. Russia with a much larger population has a smaller labor force. They are in a stage of a rapidly growing population. We are in a stage of greater stability of population. The greater the stability of the population, the less rapid is the growth, hence the larger is the proportion which is in the working age group. So you have to consider not only the population, but also its age distribution and its composition. Our labor force today is somewhere around sixty-two to sixty-five million people.

The second element we have to think of is the degree of employment of that labor force. We hear all kinds of talk of "full employment". The term "full employment" is really "high level employment". If we ever reached a point of full employment, our whole system would be completely rigid with no mobility or flexibility. Full employment really implies: "With a sixty million labor force—somewhere around one to two million unemployed." They were the float. That's the group that provides the flexibility

to shift from job to job as the production of certain things is stepped up and other things are curtailed.

In war time, at the peak of employment during World War II, we got down to a figure of about eight hundred thousand unemployed. At that stage our whole system was tight and rigid. The problem of staffing various munitions lines which were on the upswing, of transferring workers from the lines where production was to decline to those where we needed more workers was a terribly difficult job with that degree of unemployment. Ordinarily we need somewhat more than that to provide the flexibility required in a changing production pattern.

The third element is the amount of time workers are employed. Here, I think, today the average work week, taking days off and things of that kind, is somewhere around 35 hours a week. I think the standard forty-hour week now has gone by the boards somewhat. With that length work week, again we have more flexibility for expansion, because the stepping-up of the work week is easier. If we are already working a 48 or 54 hour week, the possibility of flexibility to step it up is much more limited. In the last war we had an average increase in hours per worker of up to 25 to 35 per cent, because we had that flexibility. There is not that same flexibility in nations which are already working the much longer work week.

In addition to those broad elements in the labor force. we have to think of a special problem in wartime, because probably the most able and the most vigorous of the labor force is drained into the military service. Also in wartime, the need for particular kinds of skill is much greater. The shift is to hard goods production and out of soft goods. The need for mechanical skills is much greater. But again, those same skills are needed in the armed forces, and the problem in wartime to get those particular

skills—to get them in the places where they are needed—is extremely difficult. The training problem in wartime—the training of the type of workers which are needed for the particular production line, is one of the most difficult of the mobilization problem.

In addition we must consider a particular kind of labor group —the supervisory skills. In our mass production type industry, the supervisors play a very important role. Again they are the same type who make good non-coms and good officers. They are taken rapidly, and the upgrading that goes on to get the required supervisory personnel in production, raises very difficult problems. We could go on to many other aspects of that, but I have to skim lightly.

The second major factor is *natural resources.* And again I want to mention two specifically—agricultural land is the first. In a war period, the need for food is considerably greater for the same group of people eating than it is in peacetime. Believe it or not, the military consumption of food per capita is considerably greater than civilian consumption per capita. In wartime the shift in production is to hard goods production. With more vigorous work, the need of food per person is greater. Again, almost inevitably, you have an inflationary pressure during the war. People have more money to spend. They want more food. For example, back in 1939 there were about 47 per cent of the families in the United States whose annual income was one thousand dollars per year or less. During the war this average income almost doubled. I assure you there is considerable room for an expansion of diet when you start with a family earning a thousand dollars a year. Hence the need for agricultural land, because of the greater pressure on agricultural land during a war period, is very great, and the food problem in war is of very great importance.

Second, a general group of things you have heard much about already—*materials.* Most of the talk of materials before the

last war, and still to a considerable extent today, is in terms of a group which we call strategic or critical materials. To my mind they are infinitely less important than another group. No nation can be a strong industrial nation and a strong war power without what I think of as basic materials—steel, copper, aluminum, rubber, the chemical industry, oil (natural or synthetic), and power. These are the key materials—the key resources, as far as the war economy is concerned, and to my mind considerably more attention should be given to the readiness of these material industries in peace time as a possible preparation for war than to give almost exclusive concern to the strategic and critical list where stockpiling is the temporary solution.

The third major factor is *productive equipment*—industrial plant and machinery. In this country we have a larger volume of machinery and equipment per worker than in any other country in the world, and it accounts for our very great productivity per man. Our productivity is about twice that of the highest European country. During the war, in comparison with Russia, we had about three to four times the productivity per man, and about five to six times the productivity per man as compared to Japan. That is largely accounted for by the machinery and equipment which each man has to use, and also by the skills with which the men are coordinated and the production process is integrated. Production equipment of all kinds is a very key element, but there is one in particular that I want to emphasize. That is the machine tool industry, which makes the machines which produce the goods we want. We have the largest and most highly efficient machine tool industry in the world. If we are going to have the possibility of shifting production lines from one product to another, in which we have to retool, then if the machine tool industry is not up to snuff, our flexibility is greatly limited. We have heard the term "armed in depth". Armed economically in depth is of equal importance,

and for that we need a machine tool industry. The shift, for example, from the B-17 to the B-29 would have been impossible without an effective machine tool industry because the tooling had to be completely different. Practically all tools, that is the big machine tools, were scrapped from the B-17 lines when the B-29's came in.

Where rapid shifts are required to improved types of munitions, they can be produced only if we have the tools. If we have an effective machine tool industry, such shifts can be made rapidly, as they were. To my mind, Russia's greatest weakness at the moment is its lack of a really first class machine tool industry. During the last war we provided the bulk of their machine tools. Today they are doing everything possible to get machine tools from us. But the idea is to have the "know-how" to make the tools, to make the things we want, and that is a very critical element in our war potential.

Another element is the size of our production units. This question of the size of the largest units, creates all kinds of problems of control of industry, charges of monopoly, and things of that type. But in wartime, I can assure you, they are a boon, because the large production units have a facility for organizing big production jobs and for integrating all of the steps in the production process. Giving a contract to a large unit like General Motors means that you put on the shoulders of General Motors the problem of integrating a production job, in lining up the subcontractors, in lining up the materials, and getting all the parts of it tied in together. If that had to be done almost entirely from a central point, the control job would be almost impossible; hence time after time, during the war, many thanks were given for the size of many of our production units.

A fourth factor, and one of vital importance is *managerial ability*. This comes down to the skill of integrating the various

other production factors, in devising means by which they can be made more effective, and in supervising and integrating the whole flow of the production process. We are again very fortunate in our type of economic system to have probably the best training ground possible for the development of managers. Our skill at management and our management "know-how" are the envy of the world. Without that "know-how" in management techniques, our whole system would be considerably less effective. And that consists, to a very great extent, in the ability to break a job up into its detailed component parts, and to be able to fit men and machines to a job in the most effective fashion. Where you have the problem of many workers being unskilled and not trained for a particular job in war time, the need for breaking each task up into its simplest elements is of even greater importance than in peace time. And the fact that our management techniques, our production techniques of a mass production character, do break complicated jobs up into simple elements, meant that the problem of training workers was considerably easier.

Finally, one additional point is *research*—scientific ability, scientific skills and technological research. "If you don't keep up, you are lost." At various times you have heard that phrase. You have to either be ahead scientifically, or lose. New production techniques, new weapons, new materials, new ways to substitute for things that are scarce, all are a part of the technological scientific problem which I just want to mention as vital.

Those in general are the fundamental factors, the basic factors, which determine the maximum to which our economy could go in reaching its top. How do we attain it? What are the measures to attain maximum production in war time? The first thing I want to point out is that we cannot rely on the type of incentives and motives that exist in peace time. In peace time, our system is what we call "a profit economy". Resources, both human and physical,

move into those lines of production which offer the possibility of the greatest return. If a thing is scarce in relation to what people want, there is a tendency to bid its price up, to make that line more profitable. Additional firms come into the business or old firms expand. Perhaps the possibility opens of paying higher wages to attract more workers; hence the incentives for movement of resources in a peace time system is the opportunity of greater wages, greater profits, and a greater return per capita. We cannot rely on that in war time. The problem in war time is the shift from peace time pursuits to munitions production. True, the government, in buying munitions may quote a price which offers a better-than-average profit and which enables the new munitions lines to offer higher wages to attract workers. To an extent, that type of natural or normal incentive can be used, but it is limited for this reason. As we pay more to workers and as equipment gets a greater return, they have greater income. But at the same time resources are shifted from peace time products, hence the supply of those products is reduced. If incomes are higher, people can buy more. The inevitable result is that the prices of peace time products will tend to rise, and we are back in the same place we started, because then those producers can raise wages to attract workers and resources are attracted back again. Or, it becomes a kind of a "step" proposition with greater and greater inflation. We cannot rely solely on the profit motive in war time to get the shift of resources needed. Secondly, there is a natural apathy to shift to munitions industries for a war period of indeterminate length from a line of work that you are used to and to which you want to return after the war. No worker with an established home wants to uproot himself and his family and move to the new areas of munitions production, which perhaps are on the coast or far away from his old home in new areas where housing is not adequate. It takes a very major incentive to get those shifts. We have to rely on something more than the normal incentives of peace time pro-

duction. We have to establish central controls, and the controls have to be operated from a central point in order to force the necessary shifts.

Now what controls are needed, and what is the objective of the use of such controls? The first stage of the process is the central plan. In a war time picture, especially today, it is a problem of planning for the utilization of total resources. It is not simply a question of a military production plan. It is a control plan for the entire economy. It is a total-control program. The first stage of it, of course, is the formulation of military requirements —the translation of the strategic and operational plans into logistic requirements, and these in turn into production requirements for the various types of munitions and allied products required. But in the formulation of the overall plan, I would like to stress very strongly, that there is great need for integrated individual plans developed cooperatively and simultaneously, involving three elements—namely, the strategic and logistic elements; second, the economic elements, involving what resources are available and how they can be mobilized or utilized; and third, the political elements. The latter involves questions of what kind of an economy we are going to have, the degree of belt-tightening possible and still retain a healthy civilian economy, the possibility of war time and post-war stability, and the effects of various actions on the ultimate transition to the postwar semi-normalcy. The three types of decisions, the three types of plans must be developed simultaneously, concurrently and cooperatively. The time wasted in World War II, in separate planning and in a kind of a resistance towards working together intimately between the political groups—represented primarily by the President and Congress—the civilian production groups—the War Production Board, the Office of War Mobilization, etc.—and the military services, cost us a great deal of time and many errors. Today, the organization, at least, for mobilization

planning, the National Security Resources Board and the National Security Council, provides for that mutual exchange. I want to emphasize very strongly that that is the only way in which the plan can be developed most effectively. We must have a unity in the planning groups and an intimate interchange of ideas as the basis on which the total plan is to be developed.

Even so, the first to be developed must be the military plan. That, in turn, has to be judged against the availability of resources of the particular kinds required, when and where, plus the general political appraisal as to how much and how fast the civilian economy is to be disrupted. Perhaps we discover that the military program can be achieved as it stands. Perhaps modifications are necessary, and then it is a process of steady give and take. The size of the program, military or otherwise, has to be large enough to provide a real incentive to get the wheels going hard and fast. At the same time, it can't be so large that we have to commit all of our resources in a rigid program at once with insufficient flexibility for later adjustment and change. Change in war time is inevitable. We have to have some flexibility to make those changes, yet the entire program must be large enough to provide the drive to achieve maximum production. President Roosevelt, in his message in early 1942, called for the production in 1942 of sixty thousand planes, forty-five thousand tanks, a huge number of ships and other munitions in balance. He called for one hundred twenty-five thousand planes and seventy-five thousand tanks in 1943. These goods were so huge that everybody practically threw in the sponge until they saw he meant it, and then they got behind it That was the incentive program, the high goal, that was needed at that stage to really get action and the economy mobilized. As far as numbers are concerned, neither goal was achieved. But if you want to add, for instance, the pounds of aircraft in the type of planes that were in existence in 1942 when he made the statement, both of those goals were ex-

ceeded by the weight of aircraft actually produced. But in the interval, there were so many changes, such as increased weight of planes and types of planes, ships and tanks, that as far as the numbers went, the goals were not reached.

Once a program is established, the control system has to be geared and meshed into that. That requires a variety of things. One is a series of limitation orders. Generally the only way in which we can get shifts of resources is to prohibit the production of the things from which we want resources to move, so we say, "No more automobiles." When you can produce no more automobiles, the automobile manufacturers and workers will willingly produce munitions.

The first set of controls, then, is limitation orders, either prohibiting the production of an end-item or stopping the use of a particular type of material in the end-item which often stops production.

Second, are established priorities which direct the flow of components, materials and equipment to particular products which are most in demand. If the supply of a material is greater than the demand for it in high priority stuff, the demands of the key items can be met by simple priorities. As soon, however, as the total priority demands equal the total supply or exceed it, priorities will no longer do the job of material control. Then you have to institute an allocation system—a detailed precise system of allocations to direct the flow of particular amounts of a material, so many tons of steel or pounds of aluminum to each particular end use. When things get even tighter, at times we have to use also production scheduling to take into account in more detail the needs of each particular production line, so that no matter how urgently the end product is needed, we don't flow more to its production than can be used. These comprise a very tight, integrated set of pro-

duction controls, but a variety of others have to be used to direct the economy, such as monetary controls, fiscal controls, price controls, rationing and man power controls, and these must be integrated in with the material and resources controls.

Typically, it is easier to control the flow of materials and to establish programs in terms of a common denominator of materials than in terms of man power or in terms of price and so on. These other controls, therefore, must be integrated into the production control system rather than vice versa. That integration was never successful in World War II, and is one that is being studied very carefully now.

Two other things should be mentioned briefly in the steps to achieve maximum output. One is, what is the information you have to have to run this set of controls, this central planning? In any business you have a detailed accounting system and a set of internal records. General statistics are to the economy what accounting or bookkeeping data are to an individual business. But the problems of obtaining statistical data from the economy as a whole are infinitely greater and present some of the greatest difficulties in central planning. Peace time mobilization planning should keep alive the statistical and informational tools, in order that decisions can be made most easily when needed.

Finally, the personnel in the central planning group must be considered. There is no ideal peace time training to provide personnel for the planning which is needed in war time. The problems are over-all in character. Most of our business executives think too narrowly in terms of their own business and its problems. Here the problem is the integration of steel with machine tools, with tanks, with ships, with allocations, with rationing, and so on. It is a broad overall conception. We don't train men that way. They must, in addition, have great versatility and be able to shift rapid-

ly from one problem to another. Third, they have to be able to work effectively under pressure, including the intense pressure of criticism. They have to be able to make those tough decisions. They have to have the guts to do it and to do it fast. They have to have the ability to appraise a situation realistically even though they realize that they can't get all the information that is needed to make the best decisions. Nevertheless they must make the decisions with what information they have, and make them fast. More production men and less salesmen are needed in the lower echelons. The tire problem, one of the meanest during the war, was run by a group of salesmen for a time. Everyone was dissatisfied. A top-flight production man was recruited and things cleared right up. One of the toughest problems therefore, is to get the right type of personnel to run the top planning effort.

The last general point I want to discuss is, "How large a proportion of this total production potential can be devoted to war?" In part, that is a political decision, but one point we have to keep clearly in our minds. If the munitions production is to be at its maximum, there must be a healthy civilian economy and war-supporting economy. Without it the efficiency of munitions production will decline. The difficulty is to determine what might be called the marginal degrees of essentiality of various parts of the military, war-supporting and civilian programs and they vary with the stage of the war effort. If you take the position of "no sacrifice for sacrifice sake but only when needed," then in the earlier stages of a war production effort, the limiting factor is generally machine tools. At that time all machine tools are diverted to munitions. Civilian production isn't hurt, but it can't grow easily.

The second stage is generally critical materials—usually hard material such as steel, copper, aluminum, and zinc. At that

stage, the production of civilian hard products is cut. That, again, does not hurt the standard of living too much. True, civilians can't get a new automobile, refrigerator, or radio, but they can get enough food, clothing, etc.

The real pinch comes when the limiting factor becomes man power. Then the shortage becomes general. At that stage the most difficult allocation problems are reached. That is the stage we had reached early in 1945, and things really looked tough for the central control agencies. Up to that point the allocation problem was not impossible.

The difficulty arises because there are no guides which can be used to determine those degrees of essentiality. You have to play by ear to judge the problem. Our most effective instrument was what we called the "squealometer". If in the process of an alllocation or program determination, we achieved a uniform pitch of "squeal" from all parties, we thought that the allocation had been successful. On the other hand, too often there was an attempt to increase pure munitions production at the expense of the war-supporting activities, and we found that by starving the railroads of steel plate to make additional tank cars, freight cars, and box cars, we really ran into trouble in the latter part of the war. Then it had to be diverted out of munitions to such uses in order to keep munitions rolling into the seaports.

At the peak of war production only about forty-five to forty-eight per cent of steel output was devoted to pure munitions production, but out of a total of about 65 million tons per year of finished steel products, probably only about 20 *thousand* tons went to pure civilian uses. The rest was of a war-supporting character, going for additional oil production, for rails, for maintenance, repair, and operating supplies, for war related construction, for electric power—all required to produce munitions and transport them.

There is one additional point that I want to make in this connection. The length of time that is allowed to reach peak production is all-important in this type of decision. If there is time, it is possible to devote some steel and other critical materials to the production of additional steel plants. However, it takes about 2½ tons of steel to build the capacity for one additional ton per year. If there is time, it is possible to make the decision to build more steel capacity. If there is not time, we can't afford to devote steel for the production of more steel or other types of material. So, time is a critical factor in those decisions. Only if you have time, is it possible to build more capacity to meet the peak demands at a later stage.

I am not going to have time to go into the role of the peace time planning agencies, but I do want to make one or two final points here.

I have talked about the resources to achieve the maximum potential. I want to emphasize one or two final ones, which seem of great importance to me. We talk largely about things that perhaps we can put in balance sheets and use to compare one country with another, such as facilities, materials, and things like that, all of which are very important. But, when the real, all-out pinch comes, the key factors become things which we cannot put into balance sheets. Then it comes down to human factors and morale factors, which include the effectiveness of those who are guiding both the overall effort as well as the segments of that effort in industry itself; their skill at integrating and coordinating the production lines; the brains and intelligence they have; their skill in devising production techniques, new ways of saving materials and things of that kind; their skills to improvise, to substitute, to find new and better ways of doing things. In other words, it comes down in part to the effectiveness of management, both in individual plants and in the central planning agencies.

Second, and perhaps more important is the morale of the working force and the morale of the bosses of production jobs. If their heart is solidly behind the job they are doing, if they are convinced that the job they are doing is as important or more important than anything else, if they have confidence that what they are producing is going to be used effectively by the military services and not wasted, the effectiveness of their work will be greatly enhanced. Their confidence in the use being made of the products they are producing is vital to the morale and the effectiveness of the production effort. The activities of the services relative to worker morale in the form of incentive programs are extremely important, but there was an awful lot of muttering and grumbling later in the war in many areas. If the people as a whole are solidly behind the production effort and morale is high, then in our type of system, we can really go to town. If morale isn't high, we will lose some of the power and drive behind that effort. It comes down to the degree of unity behind the job that they are doing. If the people feel no immediate danger of attack and are not afraid, if they are seeing in the headlines that things are going fine, and if they have money in their pockets—more money than they ever had in their lives before—they want to spend it and they don't want to work in an all-out fashion. That is the time morale counts in keeping the drive and the pressure behind the job. In the last analysis when the pinch is really on, it's the morale factor, it's the heart and the will of the people doing the job that becomes the key factor in our war potential.