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STUDIES IN INTELLIGENCE

A collection of articles on the historical, operational, doctrinal, and theoretical aspects of intelligence.

ECONOMIC INTELLIGENCE

by Paul W. Howerton

EDITORS NOTE: *This article is based on talks given by Mr. Howerton at the Industrial College of the Armed Forces in 1955 and 1956. We are grateful to the Commandant of the College for making the transcripts available to us.*

THE first order of business is to identify the problem of economic intelligence. It is a problem very like that of the college economics professor in the classic story about the examination papers that, year after year, ask the same questions. The punch-line hardly needs repeating: "in economics, we never change the questions, only the answers."

This is the problem of economic intelligence. We in the intelligence profession have the questions, which remain reasonably constant. It is the answers we have to change. Through a process of refinement, through successive approximations, we hope to approach the true picture of the outlook in the economic sector of the various nations we are called on to study.

Perhaps the best way to treat the subject of economic intelligence is to borrow the journalistic breakdown into the five W's and the H: "who," "when," "why," "what," "where," and "how." The first question is *what* — *what* is economic intelligence? It is the appraisal of the capability of a nation to support a war. This is, to be sure, a simplified definition, but it covers almost every important aspect of the activity.

The "Why" of Economic Intelligence

The second question is *why* — *why* do we prepare economic intelligence? We prepare it because we now recognize that

many of the operations undertaken during World War II were not successful, or were unnecessarily delayed, owing to the lack of sound economic intelligence. Consider, for example, a speech made by General George C. Marshall on 9 September 1939, just a week after the war started. He said:

> The true philosophy of the maximum war effort of any nation is for it to devote as much manpower and as much supply power as the nation can support. I suspect that Germany is now pursuing the very philosophy I have just outlined. For some years now she has been devoting over 50 per cent of the productive effort of her country, including men, plants, and materials, for the preparation of war, and now actual war. So it follows that she is now geared up to her maximum effort.
>
> It is important to note, however, that she was not able to reach this status overnight. It has taken her some four or five years of intensive effort to develop the raw-material capacity to support her maximum effort. It is now generally accepted as a fact that it requires far more time to mobilize the industrial effort of a nation to the war load than it does to convert civilian manpower into soldiers.

This man was Chief of Staff of the US Army. He was alleged to be the best informed man in the country on the capability of the potential enemy, and he said that Germany was then, in September 1939, geared to its maximum effort. The Strategic Bombing Survey conducted after the war indicated that from 1939 to 1944, in the fields of explosives, tanks, and aircraft, German capabilities increased six times. The over-all increase of the German economy was two to three times. The British, with a 200-year tradition of intelligence research behind them, said at the end of each war-year, "Germany has now reached her peak." And during every successive year, that peak was surpassed.

This, then, illustrates the *why* of organized economic intelligence research. Since the war such great soldiers as Field Marshal Montgomery have listed the essentials for national

security, based on their experience. Montgomery, in August 1947, said he believed these essentials were:

1. Strong national character.
2. Great development of scientific and industrial research.
3. Powerful and well-disciplined industrial power.
4. A regular army.
5. Preparedness.

Three of these five essentials are economic intelligence targets: "great development of scientific and industrial research" (we have to know what intentions and capabilities may be for the future), "powerful and well-disciplined industrial power," and "preparedness" (both of these fall into the category of economic intelligence).

Economic intelligence is, in sum, the appraisal of the capability of a nation to support a war, also an estimate of its vulnerabilities and of its intentions. Economic intelligence is, indeed, probably the best long-range indicator we have of intentions. On the vulnerability side, the intelligence community must have, necessarily, a consideration of *exploitable* vulnerabilities — a vulnerability is unimportant unless it can be exploited.

"When," "Where," and "Who"

When is economic intelligence produced? It is produced for both current and future use. The field of economics, broad as it is, requires an intensive study, sector by sector, in any given country to determine the aggregate of its economic potential. Furthermore, economic intelligence depreciates at a constant rate of, roughly, 20 per cent a year. At the end of six years' time, a piece of economic intelligence developed from data published this year will be worth only 35 per cent of its present value.

The intelligence community is charged, then, with keeping current on economic developments within the countries under study. These efforts are by no means confined to the study

of the economies of the Soviet-dominated world. It is equally important that we be equipped to understand the capabilities of our friends and alleged friends. There is, for example, probably no country more closely associated with the US in the protection of North America than Canada. There is probably no closer working relationship between any two nations in the world. And yet we produce intelligence on Canada and on its capabilities to assist us, to support us, and to augment our facilities for war.

Where is this economic intelligence prepared? Part of it is prepared in CIA. Part, in the Department of State. The military contributes. In National Security Council Directive No. 15, which has been interpreted by the Director of CIA as DCID 15/1, responsibility for economic intelligence research is allocated to the various agencies. The Department of State deals with broad-gauge economic policy problems. CIA confines itself to the Soviet Bloc and the peripheral areas which may contribute to Soviet capabilities. The military components contribute all the military-economic intelligence that is so necessary to the proper understanding of the capabilities and intentions of a potential enemy or friend. The interpretations placed on the happenings of the day are contributed across-the-board, by all people who are competent to make such contributions. Consequently, no single organization can (or, indeed, does) operate *in vacuo* to produce economic intelligence. It is far too important a subject to trust to a single organization or a single individual.

Techniques and Methods of Economic Intelligence Production

The next question is the one I will treat at greatest length: *how* is economic intelligence produced?

The chart (Economy of the USSR)* purports to analyze only the economy of the USSR and most of the illustrations I will use are drawn from studies of the USSR. The application of the techniques and methods discussed, however, is as broad as the subject matter of economic intelligence. I will discuss

* This chart was devised by my good friend, Bill Tidwell of ORR.—Author's Note.

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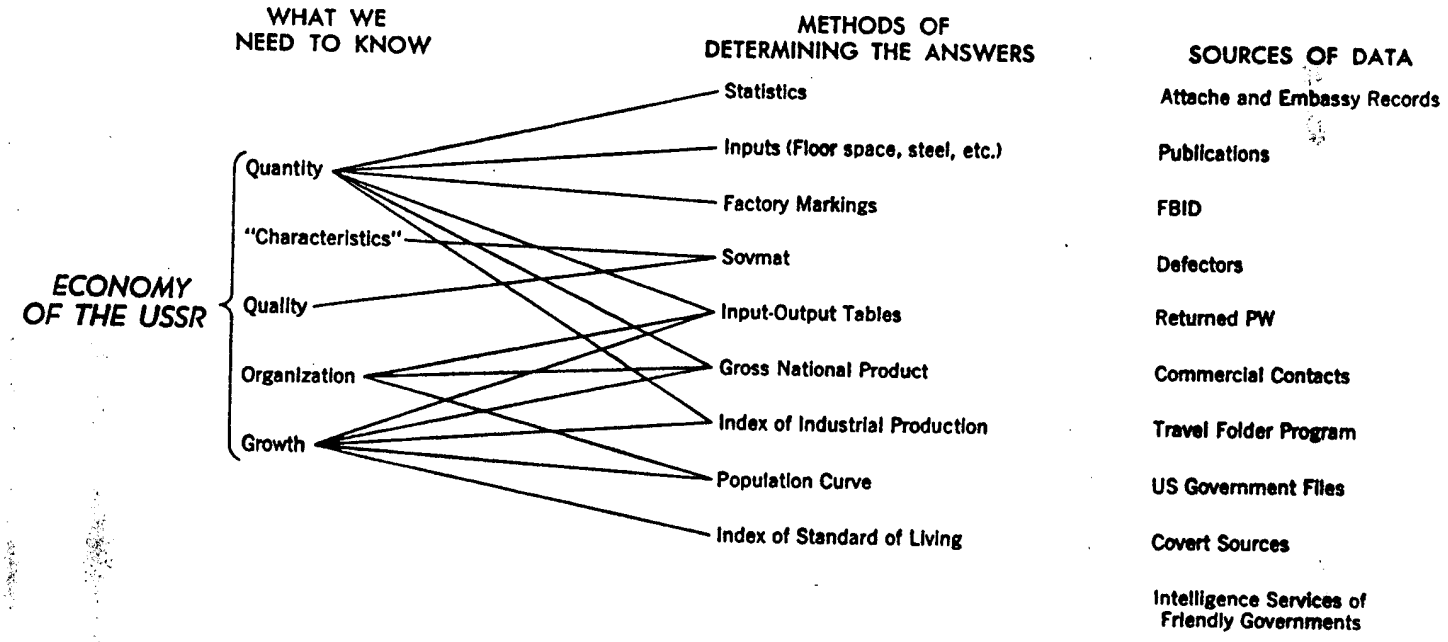

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the methods that have been developed for answering the questions put to the intelligence community by policy-makers and also the sources of information drawn upon.

The chart, furthermore, breaks down economic analysis into five major subquestions. The first is that of quantitative analysis; the second and third deal with qualitative analysis; the fourth deals with the organization of the economy, and the fifth subquestion, with the growth of the economy.

A number of techniques are available to quantitative analysis. First of all, there are the statistics published by the country in question. In the case of the USSR, the statistics are, by and large and with the qualifications discussed below, good. Intelligence agencies have carefully analyzed these statistics, both for their internal consistency and for their external influence on the operations of the countries within the Soviet Bloc. The consistency of components within an aggregate can easily be checked against announcements of future changes in the aggregate itself as well as changes of individual components. The consistency of data on all levels, including estimates of changes in the physical productive capacity and the commodity outputs within the Soviet Bloc, has been verified for a sufficient number of cases to convince us that the Russians are not attempting, in general, to distort their published statistics.

Having said this, let me give a few examples of precisely the opposite — cases where the Russians have indeed distorted, or where interpretation is necessary to understand properly the statistical analyses made by the Soviet Central Statistical Bureau. A Soviet rubber-producing plant turns out both rubber tires and rubber heels. An announcement came out of this plant saying that the goal for tires had been missed by 50 per cent but that the goal for heels had been exceeded by 50 per cent — which, according to the Russians, meant that the overall production goal was met by 100 per cent!

Another example comes from the humor magazine, *Krokodil*. A cartoon appeared in this journal, some time back, which showed the manager of a machine tractor station standing on

the porch sending off a deputy to the local commissar with the admonition: "Don't forget to tell him that half the plan is 100 per cent fulfilled."

All of which demonstrates that Soviet statistics need careful analysis. They cannot be accepted completely on face value. But by such analysis, and by careful review of the aggregates that we are able from time to time to accumulate, we have come to the conclusion that the statistics are, by and large, valid.

Input Analysis

A second tool of quantitative analysis is the method of inputs. There are certain basic relations, that is to say, that are constant throughout a given industry. For example, the floor space in an aircraft plant is proportional to the number of airplanes it can produce. This relationship has been checked out in a number of aircraft companies in the US and in friendly countries and found to be valid. Other methods have been developed to relate seemingly unrelated commodities — commodities which seem to have a mutual control over one another. An example is steel and rubber. The Joint Intelligence Bureau in London developed this factor: the amount of steel produced in a given country is directly proportional to the amount of rubber consumed. This factor has been tested in the US, France, and Italy and found to be valid. These are two examples of how factors can be developed so that, given a bit of information collected by an observer in the USSR on some plant or industry, one can by deduction determine the approximate production capacity of that plant or industry.

Markings Analysis

In intelligence, as in laboratory research generally, we try to verify our results by using a number of different analytic methods. One of the most useful of these methods is that of factory markings analysis — next item on the list of tools of quantitative analysis. Factory markings are those trade marks, inspectors' marks, or other stampings, that appear

on most any finished product. These markings are unique for a given plant or even for a given department or inspector within a plant. Factory markings analysis might be called the Bertillon system for the identification of products and producers.

Even though the field is in its infancy and was only developed during World War II, some examples drawn from wartime experience demonstrate its enormous possibilities. The average monthly production of tanks in Germany in the period 1940–1942 was estimated, using conventional intelligence methods, at 1550. The markings people, who had analyzed the markings on captured tanks, set the figure at 327. When the Speer Ministry files were captured, the true figure was found to be 342 — 327 (markings analysis) against 342 (true figure) against 1550 (conventional analysis). During 1942 the conventional estimate of German truck production was 200,000; the markings estimate, 97,000; the Speer Ministry figure, 80,000. The 1943 average German monthly production of tires was estimated by conventional methods at 1,250,000; by markings analysis, 175,000; the actual figure, 186,000. It is, of course, just as bad to overestimate production as it is to underestimate it. It has been said that the invasion of Europe was actually unnecessarily delayed a year because of bad intelligence and, especially, bad economic intelligence.

Modern machine methods handle the raw data of markings analysis in the Joint Markings Center maintained by CIA in collaboration with the Army, Navy, and Air Force. Markings analysis is going to be one of the potent techniques of economic intelligence in the future. Its method is that of statistical analysis; and, consequently, the larger the sample, the more accurate will be the conclusion. With five MIG's available to US intelligence, markings analysis has produced an estimated monthly production to within one plane of the figure arrived at through other intelligence methods. Just to illustrate the dimensions of the markings effort, by the way, there are 36,000 distinctive markings on a MIG, of which 3,600 are significant for markings analysis.

Input-Output Analysis

A system of input-output analysis — or, inter-sectoral analysis — is useful for quantitative estimation, because it shows the changes that can occur within an economy for any given stimulus. Take, for example, an input-output matrix for the Soviet petroleum industry (plotting products on the vertical side and industry on the horizontal): the agricultural sector within the USSR uses 23 per cent of total petroleum output; energy production uses 12 per cent; manufacturing, 11 per cent; transportation, 24 per cent; household uses, nine per cent; and the military, eight per cent. This adds up to 87 per cent. The other 13 per cent is that bit of petroleum the Russians have been using for barter with the West for scarce and necessary machine tools.

Input-output on electric power is another useful illustration of this technique of analysis. In their current plan, the Russians hope to have 170 billion kilowatt hours of electricity production a year, which would require 83 million tons of coal to produce. For each kwh, 1.2 pounds of coal are required. If the USSR decides it is going to have, say, more aluminum and will therefore have to increase its power requirement to 200 billion kwh, 95 million tons of coal will also be required. This new coal requirement of 12 million tons must now come from new mining activity or must be reallocated within the present consumption pattern.

As one further example of input-output analysis, consider a changeover in a given Soviet *oblast* from horse-drawn agricultural equipment to tractors. This sounds, at first, like a simple transformation; but, to increase requirements for tractors means much more than just an increase in tractor production; it means, as well, an increase in steel production, in electric power production, and in electronic control; and it means an increased demand for management and skilled labor. The reduced requirement for horses, on the other hand, will mean among other things a larger food supply for the people. It is just this sort of complex economic interrelationship that input-output analysis can help to clarify.

In sum, the development of a matrix of input-output will show the implication of any change within any sector of the economy for any given product field that appears within the matrix. This type of analysis can be extended and refined as far as the matrix can be manipulated; at present we have a matrix which will take 61 items in the vertical columns and 61 items in the horizontal rows; this may be built up, at some time in the future, to as large a matrix as 1000 x 1000. This would require electronic calculators. To handle even the 61 x 61 matrix requires a good deal of calculation and a good many man-hours.

GNP and Industrial Production

The gross national product (GNP), which is an aggregate in money units of the total value of the goods and services produced in a given economy in a given time period, is an important indicator of the magnitude of a country's economy. There are, however, many problems associated with GNP estimation. In December 1953, for example, when the American Economic Association met in Washington, the *Washington Post* asked a group of economists whose job it is to study GNP: "What do you estimate the US gross national product to be for 1953?" The *Post* had to draw a normal distribution curve to get the best guess! Thus, GNP by itself is, at best, an over-all indicator; some of its implications will be discussed below under the heading of the growth of the economy and in comparisons between the West and the East.

The index of industrial production is an important quantitative indicator, for two reasons. The standard method of handling this index is, of course, to take a base year and call that, arbitrarily, 100. Then all other years are related to it to determine whether there has been growth, stability, or retrogression in the capability of a given sector of the economy. There is also a second way to use an index of industrial production. In a given industry with a capacity of 100 for any given time, this index will show at what capacity it is actually operating at one particular moment. This index, furthermore, can

indicate seasonal operation within industries and thereby make intelligence operations and target analysis that much easier.

Qualitative Analysis: Sovmat Program

To turn now to the tools of qualitative analysis, there are two major points involved. First of all, there are the characteristics of a product the country decides it needs. These characteristics will be the specifications assigned the product. Qualitative analysis will aim at finding out how closely these specifications have been met. This is done, here in the intelligence community, by a program of analysis of foreign materials and equipment produced throughout the world.

In the case of the USSR, we have the Sovmat — or Soviet Materials — Program. We buy all manner of things and have them analyzed for quality by US industry. For example, the first item procured by the Sovmat Program was a can of tuna fish. An unglamorous item, to be sure; but the analysis of the tin, made by a leading US steel company, revealed that the Russians had perfected tin-cladding to a degree as yet unknown in this country. On the basis of that analysis, the steel company undertook a new research program of its own.

There are also, frequently, interesting peripheral benefits from the Sovmat Program. One concerns a bale of yak wool which originated in Sinkiang, crossed the Himalayas, came down through Pakistan, was purchased in Karachi, and was shipped to the US. An analysis was to be made by a major US wool processor. When they opened the bale, they found complete documentation for a person to travel through Sinkiang.

It is possible to generalize on the quality of Russian products in this way: they are utilitarian. There is no excess of decoration. The Russians obviously believe that a train car will get you from Point A to Point B just as quickly without the chrome trim and the fancy seats that Americans seem to like. Russian tanks are extremely formidable, even though they have not buffed off the burrs from the welding seams. Russian guns

fire just as well even though the projectiles are not machined to the tolerances common in US industry. Quality, that is to say, is strictly an applied matter as far as the Russians are concerned; they maintain quality only to the minimum possible extent consistent with use.

Organization and Growth

The organization of the economy is studied in a number of ways. Input-output tables have already been discussed above. The population curve is one important measure of economic organization because, in developing it, one must also determine what skills are being maintained or improved and what skills are in short supply.

Gross national product is worth mentioning again in this connection. The GNP for 1954 for the Sino-Soviet Bloc is estimated (in 1951 dollars) at 223 billion. The GNP for the NATO community is estimated at 546 billion. The GNP for the USSR is estimated at 123 billion and that for the US, 360 billion. Note the interesting relationship that exists here: within the Soviet Bloc, the USSR accounts for almost the same proportion of the total GNP as does the US in the NATO community. The USSR, that is to say, is the direct US counterpart within its own economic community. The growth rate of the Soviet GNP is now estimated to be of the order of 6 to 6.5 per cent a year and that of the US, 3 to 4 per cent. The US GNP is at present 2.92 times that of the USSR. With present estimated growth rates, therefore, and with the US having a base almost three times that of the USSR, the GNP curves will not intersect in the foreseeable future.

The growth of the economy in any country is analyzed by using much these same techniques — input-output tables, gross national product, index of industrial production, population curves, and, more recently, the index of the standard of living. This last was added at a time when, on 5 August 1953, Malenkov made his famous speech on consumer goods — which was, of course, just so many words. There is no evidence that the

consumer goods program was ever intended to be implemented, much less that it was ever actually implemented, from analysis of all available materials.

Sources of Information

This completes the survey of the five questions the intelligence community is called on to answer and of the primary methods for determining these answers. Where, then, does the community get the necessary information?

First of all, there are overt sources. One never knows when an industrial publication of, say, the Soviet Ministry of Agriculture may have a great deal of information of interest to people studying ferro-alloys. Design information is commonly given in such publications. Specifications are also frequently given, as well as material which contributes to our understanding of markings. Open journals often publish information on future planned production within a given economic sector. Information from overt sources — like radio broadcasts, newspapers, journals, and books — is, furthermore, often more accurate than information collected by clandestine means. If I am able to make only one point in this discussion, I want it to be this: there is absolutely no relationship between the validity of a bit of information and the classification of the document in which the information appears.

Defectors are another source of information. The intelligence community has been misled, however, and needs always to be chary of this source. It is difficult indeed to establish bona fides. And the method of screening must be greatly improved before defectors can be considered a really major source of information.

Returned POWs are of little value — but mostly because the interrogation system is imperfect. There have been interrogation reports in which an individual, whose POW background indicates he has been a member of a road gang on a Hungarian railroad, was asked as a lead-off question: "What direction do you think the economy of Hungary will take in

the next five years?" This sort of absurdity has to be eliminated. Fortunately, procedures with both defectors and POWs are being constantly refined.

Commercial contacts within the US are used to analyze materials collected from the Soviet Bloc and other countries. Commercial contacts are used, also, to provide positive intelligence which has been collected by members of commercial organizations as they travel about the world. It is a valuable source of information — not, however, without difficulties because some people who go outside the US and have been contacted by CIA fancy themselves cloak-and-dagger operators and act accordingly.

Attache reports are another important source of information. All military, naval, and air attaches who go out to Soviet Bloc countries are now trained in industrial observation, through the travel-folder program. [redacted] I thought that I knew the chemical industry pretty well and could identify a chemical plant — until I took that course. I found that my knowledge was strictly limited to the configuration of US plants and, consequently, I learned a great deal about the configuration and equipment of European chemical plants.

US government files — outside the intelligence community — are another fertile source of information, and a source that has not yet been exploited as thoroughly and as completely as it should be. Why is this? Because of sheer, simple bureaucracy — the objection of bureaucrats to making their files available. A major effort just now is directed to the study of gold manipulation by the USSR. There is surely a great deal of information on this subject located in various files around Washington. The Economic Intelligence Committee, which has on its membership list practically every major agency and department in the government, sent out a call for information but, despite hints that it exists somewhere, very little has been forthcoming. This problem, clearly, has to be solved. As a

last resort, it may be necessary to get a National Security Council Intelligence Directive. It seems strange to me that it should be necessary to have to go to this extreme for authority to get nothing more than intragovernmental collaboration and cooperation on matters of national security.

Covert sources of information — down near the bottom of the list in the chart — are the last resort when all other sources have been exploited. They are the last resort because they are are so very expensive in time and money.

One final useful source of information is the foreign intelligence agency. [redacted]

The Consumer of Economic Intelligence

The final question is: *who* uses economic intelligence? The Office of National Estimates in CIA has charge of the production of National Intelligence Estimates and, in so doing, tries to get the best thinking of the community on a given subject and to produce an agreed estimate of a situation. These opinions are distilled down — sometimes the expression is "watered" down — so that the President and the NSC can have an overlook of the estimated results of certain courses of action bearing on a policy question. It is the purpose of intelligence to furnish facts to whoever needs them. The need to know is, of course, the overriding factor in the dissemination of intelligence to consumers.

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This has been, then, a summary of economic intelligence in terms of its definition — appraisal of the capability of a country to support a war. *Why* is it prepared? In order to estimate the capabilities, the vulnerabilities, particularly those that are exploitable, and the intentions of the potential friend or

enemy. *When* is it prepared? On both a long-run and short-run basis. *Where* is it prepared? By the entire community, by all the assets that can be brought to bear on the problem. *How* is it prepared? By all manner of different techniques, all part of the mechanism of successive approximation. *Who* uses it? The national policy-maker.