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The Philippine Economy During the Japanese Occupation, 1941-1945

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Abstract

Few studies have analyzed the Philippine economic experience during the Japanese occupation. Although such studies are in the nature of history and commentaries, they have not focused on the economic analysis of the war experience. The present study hopes to close this gap if only partially by recounting what was known about the course of the economy. A recently discovered intelligence document written late in wartime by American sources on economic changes during the occupation period provided the initial impetus for the review. Relying on limited relevant work to make an assessment of this intelligence report, the author carries the discussion to modern day interpretation covering the various sectors of the economy. In the final part of the paper (Part IV), the Philippine economy is compared before and after the end of the war, investigating the extent of the fall in national output by the war's end, quantifying the extent of the hyper inflation that was experienced in the course of the war, and approximating the relative value of the economic damage (mainly to capital stock) caused by the war in terms of the level of national output. Using intuitive knowledge based on the review of these sectors and employing conservative assumptions about the Philippine economy, the author suggests that at the end of the war, national output was at least 30 percent of the level of the prewar output. In effect, total output in 1945 was 70 percent lower than that of 1940. Going to the estimate of the war damage in today's current terms (2003), the economic loss (not including human, of course) suffered during the war was equivalent to 13 percent of the current GDP of 2003. Translating this to the output of 1940 on the very conservative assumption that there was no growth of per capita output over the years, the economic loss from the war was 62 percent of the GDP of 1940. Since the economic damage to capital happened over time and furthering the output loss as the war went on, these estimates conform to the assessment that Philippine GDP in 1945 – at the end of the war – was close to 30 percent of the output of 1940.

Key words: Philippine economy, Philippine economic history, Philippines during World War II, Japanese occupation of the Philippines, inflation, economic damage from war

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I. Introduction

The performance of the Philippine economy under Japan's occupation during the Second World War is widely known to have been a deeply negative experience. But exactly by how much and in what respect is one of the large voids in the historical literature. The collective experience acknowledges that economic destruction and decline ensued during more than three years of war conditions. As a collective experience, it is intensely etched in terms of the pictorial and anecdotal memories of war and hardship among those who lived it. Although the national consciousness could make of that experience sufficient imagery, it is not enough for true nation building. For Philippine historiography and scholarship, the void speaks of a failure to fully keep an accounting of the war experience.

That Filipino scholars studied other problems immediately after the war could be understood from the need to focus on the future and on more positive issues. With the achievement of political independence in 1946, Filipinos were more preoccupied with the challenges of rehabilitation and development. These were forward looking themes of commitment. Historical accounts of the occupation have been mainly undertaken from the political, social and cultural side. As expected, the war would produce many biographical accounts and still many more military accounts of a personal and group experience.

For their part, American scholars specialized on the Philippines were likewise preoccupied. It was probably natural that the problem would come under relative neglect given the larger concerns of the times. Studies on the Philippine economy began ostensibly after the country achieved independence. Scholarly studies would sidestep, if not neglect, the occupation period.

Frank Golay (1961), in his comprehensive survey of the Philippine economy during the postwar period, analyzed the economic backdrop during the first decades of American occupation. He used as benchmarks the immediate prewar data and the period from independence in 1946. This provided a continuity of the history with the past American colonial administration but left out the Japanese occupation period. As Golay's co-worker, Marvin Goodstein (1961) undertook benchmarks for the calculation of output and growth between the years 1938, 1948, and 1956.

Writing on the economic history of the Philippine past, O. D. Corpuz wrote much about the Spanish colonial times and portrayed the American period in broad strokes but omitted the Japanese occupation. Teodoro Agoncillo[1], recounting the history of the Japanese occupation, mainly gave an account of the political, cultural and social history of the period. Economic issues were entirely incidental, although there was a chapter devoted to economic conditions of war time. He tried to get a good grasp of the from

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*Professor of Economics Emeritus, University of the Philippines. This topic of research arose while spending a recent vacation in Washington D.C. and reviewing materials on the Philippine economic past at the United States National Archives and the Library of Congress. I owe a lot to the kindly and helpful librarians and archivists of these two depositories of knowledge. I continued the research at the libraries of the University of the Philippines, at the Filipiniana section, to update me on an old interest in historical issues. The help of the librarians of the School of Economics and the Filipiniana section of the Main Library is gratefully acknowledged.

[1] The two-volume work of historian Teodoro A. Agoncillo (1965) is the most widely read account of the Japanese occupation period. Most other works by Filipinos represent accounts of their exploits during the war or celebrate the contributions of persons or of particular units that participated in the war. The works of politicians and many public figures are largely in the nature of defense of their role in the war and are therefore of the self-serving variety, however significant their contributions might have been.

oral, anecdotal, and documentary history to give an assessment of the economic objectives of the Japanese Occupation.

The useful work with a direct reference to the economy under Japanese occupation was that of A.V.H. Hartendorp (1953).[2] His two chapters on the Japanese occupation provided detailed narratives of economic developments. It was strong also in anecdotal references and in describing institutional actions and policies during the occupation period. A third chapter was on the aftermath of the Japanese occupation, discussing the rehabilitation program as well as the immediate postwar economic issues. Hartendorp's characteristic contribution is the reportorial survey of the economic events of the times. He was an accomplished economic journalist during this prewar and postwar period, one of the most perceptive and prolific commentators on Philippine economic issues for a number of decades spanning the American period to the post war years. The fact that he worked for the American Chamber of Commerce somewhat handicapped his credibility.

The present study is an effort to fill in the informational gap. The essay is divided into four parts. This introduction (which is Part I) is followed by a brief description of the Philippine economy just before 1940 (Part II). The main body of Part III is based on a reconstruction of information found in a formerly secret document about the Philippine economy during the war years as analyzed and reported by United States government intelligence sources during wartime.[3] The intelligence sources were current information taken from various sources – radio broadcasts, field reports of soldiers and guerrillas, testimonials of knowledgeable expatriates who happened to move back into the Allied front or escape from the Philippines. The military intelligence was especially critical in assessing developments about the country as the war progressed. The level of accuracy was taken to have passed the standard of reliability and accuracy as could be found during that time. The said secret report was dated August 1944, two months before the American landing in Leyte. The various sources of information that fed into this document monitored many economic changes that took place during the war.

In trying to digest this report for this particular paper, this author tried to cross check against information from writings that were available immediately after the war. This is where various post-war commentaries on the Philippine economy became especially valuable. Hartendorp's work and a rare unpublished paper by Andres V. Castillio (1946), a future governor of the Philippine central bank, provided helpful information in this regard. In general, it is astounding how much of the reports from the intelligence sources stood up to the test of later work as indicated by these two sources. Recent efforts at reviewing the war record by Japanese scholars have also helped. In this connection, Ikehata (1999) and Nagano (1999) provided additional information in respect of the mining industry and the efforts at cotton agriculture during the occupation period.

The economic changes were presented mainly as sectoral or microeconomic events. Nothing in the reports gave any hint about the aggregate effects on national output and even in terms of sector economic

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[2] The narrative style of Hartendorp was journalistic and it often related the dates official policy decisions to events that followed, therefore providing a basic source for reconstructing the historical events of the period. He was to write more volumes documenting many post independence aspects of trade and industrialization issues in the Philippines. His views of developments were often penetrating and *a propos*.

[3] United States, Foreign Economic Administration (FEA, 1944), Special Areas Branch, Far East Enemy Division, *Economic Changes in the Philippines During Two Years of Japanese Occupation*, August, 1944. Declassified document. Mimeo. The document was sensitive military intelligence at the time and was mainly pulled together from disparate radio communications and broadcasts and reports monitored and centrally analyzed by the US military. The report had 119 footnotes to substantiate the claims made. Most of the sources were from foreign broadcasts monitored by the US military intelligence. It is difficult today to check these sources except for those based on printed materials, for instance, the US government published *Journal of Commerce*, the *Wall Street Journal*. It is possible that many of the reporters used to be associated with the Philippine service of the US government. For instance, Parsons, Leach, Whitaker, Whitehead, Bain, Kraus, Steindorf, Forster, Wiener, Portrude, Billings were names listed as sources and some of these might have been former American bureaucrats in the Philippine service at the time war disrupted their careers. The report also depended information supplied from reports of civilian and military expatriates from the Philippines.

activity. Further commentary on the aggregative effects of the economic changes is undertaken in the concluding part of this paper.[4]

In Part IV, the author speculates and makes estimates of the economic losses from the occupation experience, analyzing the evidence available before the war and at the end of the war. By bridging some other sources with the Philippine data, a fuller appraisal of the economy's course during the war is presented. In particular, three areas are examined: the evolution of total output or GDP, the analysis of the wartime inflationary experience, and the measurement of the extent of the damage from the war.

II. The Philippine economy before 1940

During the course of four decades under American occupation, the Philippine economy moved forward dramatically as never before in its previous centuries of colonial past. By 1940, the country was well on the way to a prosperous future. Political independence was in the offing. The standard of living of the common Filipino was higher than in any part of Southeast Asia.

Richard Hooley (1968) and Gerardo Sicat (1968), publishing in the same journal issue, attempted to provide estimates of output and its movement over time. Hooley's study was the more carefully executed of these two studies. His work is duly celebrated for that and has widely influenced work on the Philippine long term growth. Hooley worked with detailed data, carefully put together over months of collection and refinements. My paper was simply an impatient exercise using overall trade figures and factoring in grand assumptions about population growth, own-consumption subsistence production, and the impact of government fiscal activity (that could have been subject to educated skepticism) and worked out a time series index of national output. It was an example of educated back-of-the-envelope kind of calculation that economists and statisticians are often forced to make when the void of the unknown is large and the rewards of guesses quite useful.

What comes out from these studies is that the progress of the Philippine economy during this period had been rapid even though cyclical. In fact, by 1940, the Philippine economy was probably the most accomplished in the region that would in time become different Southeast Asian countries and economies. The extent of Philippine income as well as the nature of transportation and physical infrastructure in the Philippines was generally above that enjoyed in these other countries. The steady progress of the economy under American rule was the cause of that.

The expansion of Philippine exports and the continued domestic investments in public facilities and in new commercial, agricultural and industrial ventures made the country prosperous. The tie up with the United States brought in economic advantages that were propitious for investments and economic prosperity. Access to markets for exports were available, except when the size of the industry had threatened competing American major interests. At that point, those interests influenced the US trade policy to set up quantitative barriers so as to protect the threatened American domestic industry. The major export industries of the Philippines felt the growth brakes applied at different times. Eventually, this would affect tobacco, coconut products, ropes and cordage, and, most important of all, sugar. But all these industries were, initially, during the American period the major propellers of Philippine prosperity was access to the large American markets for the industry that was fostered by free trade.

Moreover, the country's access to foreign goods for domestic consumption was unprecedented. Free trade made almost all goods cheap in the Philippines, making it the most prosperous in terms of consumer goods available in the Asian region. The free trade that American interests were imposing on the country brought access to foreign goods that were cheap for the country's residents, including of course the common Filipino.

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[4] Most of the reports on the economy from the Commonwealth government borrowed from the tradition followed by reports emanating from the Department of Commerce and Industry of the American colonial government. These reports often emphasized sectoral developments or opportunities. The various reports prepared by the Bureau of Commerce of the Philippine Islands government, such as those of Hammond's survey report (1928), became useful reference points for understanding the various industries set up in the country and the potential of future ones. The paper of Castillo (1946) was written in the same tradition as reports from the Bureau of Commerce.

American direct investments in the Philippines were quite substantial. During 1932 when a major independence bill was being considered in the US Congress, American investments totaled almost $200 million dollars. This was then a very substantial amount. Philippine access to American direct investments and to the capital markets helped finance major industries in agricultural processing, manufacturing, public utilities, engineering industries, and trading. In addition, American bonds financed major public facilities like transport, public water and sewerage systems of major cities, and other activities. American investments then would have been much larger, except that for continued decades, the uncertainty of the political independence issue always held in check further investments.[5] Even in spite of this, the potential for American investments were not fully achieved then. The evidence was that Cuba and other countries in South America, accounted for larger American investments at about the time when war broke out.

The Philippine economy was industrializing, based on an agro-industrial base, the country's infrastructure of roads, communications, port works, and public utilities more advanced than any part of Southeast Asia. Unfortunately, much of the commentary of economic writing and the popular perception viewed the connection of this industrialization as perniciously connected with the agricultural nature of the link of the industries fostered by the special economic relations of free trade with the United States. That free trade was qualified by quotas a tariffs on the major exports of the Philippines as a measure of restraint applied by the United States to please vocal competitive economic interests.

This pattern of economic growth had a basis in comparative advantage in production. Open access to the capital markets of America, to foreign investments, and any new enterprises set up could avail of the edge of the technological frontier that facilitated the growth of new industries. The state of development of the economy along many sectors was practically the envy of the region. This was most pronounced in the activity in export agriculture, in new industries that were sprouting that began to pioneer in textiles, cement. Shoe making and other wage goods began to develop. The beginnings of an engineering and construction industry were fostered by years of public works on roads, ports, and setting up machinery for sugar mills and coconut mills and other small scale industries. Exports of handicrafts had begun to enlarge – buntal hats, exotic shell buttons, embroideries. The mining industry was very progressive.

Some of the dimensions of Philippine prosperity are described in Table 1 (see annex). The country's 16.6 million Filipinos were getting educated confidently. The agriculture produced sufficient food for the people, and any deficiencies in food supply were met through imports that were well within the country's export earnings. The country's export engines were working well with major industries based on agricultural industries producing large surpluses for export incomes. The result of investments in infrastructure investment made the transport and communications system of the country probably the best among the many Asian countries colonized by other powers. In one of the testimonials before the US Congressional hearings on the economic adjustment after independence, the Philippines had the highest standard of living in the region at about the opening of hostilities.[6]

III. Economic changes during the Japanese occupation

The Japanese occupation of the Philippines redirected a prosperous, open, peacetime economy into one geared for military objectives. The occupying Japanese military organization above all had the prime objective of prosecuting a war. Economic and other issues were subordinated to this objective, even as a civil government was set up that was run by Filipinos. Initially, this civil government was turned over to a commission type government with a chairman. Then, an "independent" Philippine Republic was established that was still virtually subservient to the interests of the occupying power.

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[5] What held in check many American investments was to the uncertain prospects of the future political status of the Philippines. Of course, the politics of the country during the 1930s would be dominated by the fight for independence in the halls of the US Congress. Another reason was the uncertainty that changes in political outlook brought in decisions about investment policy. Also during the early 1930s, the United States was just emerging from the economic depression. For instance, during the previous decade of the 1920s, a proposal for the establishment of large rubber plantation estate by Firestone resulted in the withdrawal of the proposal because of Philippine legislative opposition. The key issue then was tied up with land policy, a critical problem that extends to the present time in the Philippines today.

[6] From a testimony at the Hearings conducted by the Joint Preparatory on Committee on Philippine Affairs, 1938.

The immediate effect of the hostilities was to cause changes in the ownership of assets and of goods among the parties at war. The defensive posture of the USAFFE (United States Armed Forces in the Far East) forces was to prevent control of any strategic resources from falling into the hands of the the advancing Japanese army. The initial disruption caused by that exigency was to leave into the hands of the occupying army the inventory of goods and of capital assets if no direct action took place. Stockpiles of goods and equipment were disposed of as quickly as possible by the retreating forces to private civilians and merchants before the occupation could take place. This action helped to reallocate some economic resources to the private sector. Materials of strategic value that could not be taken were destroyed. This included such valuable assets as the Pandacan oil depots in Manila and all kinds of shipping as could be sunk in Manila. As part of the commotions of war, sporadic looting of warehouses and establishments also took place thereby further redistributing stockpiles of goods among the population.

One of the first acts of the occupation army was for the Japanese military authorities to confiscate enemy assets – those owned by Americans and by others enemy. Many investments in agriculture, industry, commerce, mining and infrastructure were thus taken as war booty. The inventory of goods and services in various industries and commercial establishments that were related to the prosecution of the war was put in trust to the occupying power.

All these would result in economic disruption and would impair the future output of various industries. The supply of available of goods would decrease and cause a reduction, eventually, of goods made available for consumption and for production. The next section details on a sectoral basis much of what took place during the war.

As the initial disturbances gradually stabilized, the Japanese military authorities attempted to organize agriculture, industry, trade and commerce along lines that could be easily made to conform to the occupation policy. To do this, the civilian government was somehow needed to do the job. Changes in government administration were undertaken to determine the measures that affected the citizenry and the economy. For this, the Philippine Executive Commission was set up. Officials of the Commonwealth government were made to serve, and a large part of that government helped to render service. The Commission served as the main civilian government, although this was essentially run under the direction of the Japanese military authorities.

The Chairman of this Commission acted on behalf of the government. Almost two years of Commission government would run the civil administration, but by October, 1943, a major change took place. The Japanese sponsored the creation of the Philippine Republic per the mandate of a new constitution. These political changes did not hide the dependence of the Philippine government on the Japanese military authorities, for it was essentially a puppet Republic.

To organize economic activity, the Japanese military authorities patterned the structure of command for policy changes with the use of industry and trade associations. This was the pattern in Japan and in the areas under Japanese conquest. Industry associations served as the conduit of economic policy and of regulation as exercised by the government authorities. Under this framework, nationals of Japan or specified officials of Japanese firms were used to assure control of the economic activity. Trade and industry associations were thus formed.[7] Japanese nationals and firms led the associations that also consisted of business organizations and firms headed by some Filipinos. The Japanese tried to attract as many Filipinos to join these associations, but with limited success however.

For instance, the Philippine Copra Purchasing Union was established to organize the copra buying activity within a group. The Philippine Coconut-Dealer Association was set up to serve as intermediaries in the marketing of coconut products. The Philippine Fats and Oils Association was set up for the production of coconut products and by products of coconut. The Japanese military took the Manila Tobacco Association to assume a monopoly of manufacture and trading. Cotton growers were banded under the Philippine Cotton Growers Association. A new Philippine Sugar Association replaced the established, old association. Japanese nationals and firms played some controlling voice in these associations. Eventually, such associations would extend over to as many sectors as touched by economic activity: wine and liquor, mining, agriculture, trading, and industry.

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[7] Hartendorp (1953) described these industry and trade developments *passim* in his valuable accounts of the period.

Infrastructure, Public Utility Capital, and Construction

The investment in public infrastructure includes transportation, communications, and public utilities. Comprehensively, transportation covers shipping (including shipbuilding and repair activity), transport vessels in place for inter-island and international commerce, roads and bridges, railroads, and ports. Communications in those days referred to telephone and telegraph, radio, and mail service. Public utilities provided all these services, including privately owned franchises.

Transportation

Shipping and shipbuilding

As an archipelago, the country was dependent mainly on shipping as a major source of transportation during the prewar period. Airplanes had not yet become the work horse of travel and commerce as they are today. In 1940, the inter-island fleet consisted of 3,547 vessels of 154,613 tons net capacity. The registry of these vessels listed 62 of these as steamers with aggregate tonnage of 36,000. At total of 1,515 sailboats comprised the other larger boats with aggregate tonnage of 27,000. The rest of shipping consisted of smaller vessels: scows, lighters, and launches that were powered by steam, diesel or gasoline engines.

When war broke out, practically all the inter-island fleet were sunk or otherwise destroyed. The USAFE forces destroyed for defensive purposes all the tugboats, ships and lighters that were docked in the Manila harbor or in the Pasig River. In this way, domestic shipping became paralyzed at the time of the Japanese takeover.

To restore shipping service, the Japanese military administration put its own Marine Affairs Bureau to undertake the repair and restoration of shipping. This Bureau undertook whatever it could to increase shipping and shipbuilding, in part to restore normal transport and in part to help provide for materiel for the prosecution of military objectives.

After the fall of Manila, the Japanese seized all facilities for salvaging and repair of sunken vessels. The military government confiscated the Atlantic Gulf and Pacific Company and put its operation undermilitary control. This was likewise done to the Earnshaw Docks and Honolulu Iron Works, the Government Drydock at Engineer Island, the Luzon Stevedoring Company and other dry docks in the area of Manila. All these facilities were critical in the repair and maintenance of the salvaged vessels.

The Japanese military command put these construction and engineering facilities immediately to help in the salvage and repair of ships and barges for the Japanese military. Some of these vessels were put to use by the Japanese military in the conquest of Bataan and Corregidor. Of course, the American military made an attempt to scuttle as much as it could to remove the ships from being used in the siege that was expected as it placed itself in defensive position in Bataan and Corregidor.

By September 1943, practically all the ships in Manila harbor and the Pasig River had been salvaged. There were a considerable number of vessels that had been badly damaged and that could no longer be put to use. In these cases, the ships were dismantled and the metals were turned into scrap to be shipped to Japan for recycling into war materiel.

Inter-island shipping was probably never restored to normalcy, despite the claims of the occupying military administration. Small old wooden sailing vessels of 60 ton capacity or less became the main substitutes for inter-island shipping. Considering the relative significance of the more sturdy metal vessels, the repaired and reclaimed vessels might have been converted into military, naval, or other military purposes and redeployed in the war zones outside but near the Philippines. Intelligence estimates believed that 40 of the 62 inter-island steamers that were registered before the war had been fully restored.

There were attempts to build new wooden ships and barges. Shipyards for vessels ranging in capacity of 50 to 500 tons were used for this purpose notably in Malabon, Rizal; Sta. Mesa in Manila; Caloocan; Mindoro; Legazpi, Albay; and Davao in Mindanao. Japanese experts supervised Filipino labor in these activities. Building activity was frantic and the effort fast. Military intelligence also observed that the

new wooden tonnage did not make much headway in inter-island shipping. The suspicion was that this new tonnage was also undertaken for military, naval, or other war use.

The occupying government established a Seaman's Training Institute for the purpose of training Filipinos in coastal navigation. The military intelligence on this point, however, presumed that this was to train labor recruits for assignments on Japanese manned vessels. When the puppet regime was set up, transfer of the Marine Transportation Bureau was made to Filipino management. But Japanese experts and technicians worked there as supervisors. This might have been the case also with other sensitive bureaus of government that were linked to the command of the Japanese military.

Railways, Roads and Bridges, and Motor Vehicles

By 1940, there were two railroad companies operating in the Philippines. The Manila Railroad Company operated in Luzon. It had approximately 700 miles of railroad track. The Philippine Railway Company in the islands of Panay and Cebu had 132 miles of main tracks. As far as road non-rail transport was concerned, the main concentration were in the major islands, especially Luzon, and some of the Visayan big islands and in the major coastal areas of Mindanao where populations centers had begun to grow, such as Davao, Cagayan de Oro, and Zamboanga. The road network was extensive, but the best of them were in Luzon and in islands like Panay, Cebu, and Negros. The number of registered motor vehicles at the time of the outbreak of the war numbered 15,660 trucks, 4,840 buses, and 33,895 passenger cars.

As a defensive measure, the USAFFE destroyed and rendered inoperable a lot of equipment and railway bridges. The Japanese military, through its Railway Corps, had difficulty restoring these lines and equipment quickly. By end of 1943, however, a considerable number of damaged locomotives and other equipment had been repaired and the railway lines rendered passable through repairs. The entire Luzon line had been restored practically to prewar condition.

The rails were used mainly for military transport, but were gradually made available for civilian and freight use. The schedules were not as efficient as before the war as the trains traveled more slowly. Overcrowding of passenger cars was prevalent. The Manila-Legazpi route was able to run one train each way daily. The line became useful as a transport mode for people moving in the southern part of Luzon to Manila. The rail transport was, however, sometimes hampered by guerilla attack. Fuel used was locally mined coal and native firewood.

The restoration of railway operation in Cebu took place, but the Panay lines suffered continued paralysis due to organized guerilla resistance in that island. Intelligence reported that new construction of a 40 kilometer railway line was completed. This was made to shorten the distance between the Lepanto Copper Mine in Mankayan, Mountain Province to the shipping point in Poro, La Union. The line was planned to expedite the transport of ore and mineral between San Fernando to Sudipan, in La Union Province.[8]

In the case of road transport, the retreating USAFFE forces destroyed important bridges that were considered strategic for the advancing Japanese army. The Japanese military gave high priority to repairs of these bridges and undertook these immediately as soon as they assumed command. To finance these repairs, the military government advanced the military notes and provided the technical expertise. Labor for repairs were taken mainly from Filipino and American war prisoners.

Overall road transport overall did not get restored to prewar levels, but some strategic with military value were repaired as soon as possible. This was also true of rail transport. Planning for new roads were introduced that would help to connect Manila to Legazpi, Albay. The road from Fort McKinley in Makati was lengthened to a newly constructed pier in Manila harbor.

Motor vehicles of every usable sort were immediate objects of requisition by the USAFFE as the retreat proceeded. And this practice was continued by the Japanese military administration, to augment

[8] This statement about the 40 kilometer railway line was written as a certainty in the report. But Ikehata (1999) omits this railway line in the discussion of mining in this area, leaving some doubt that the line was ever finished. Instead, Ikehata referred to the difficulties of land transport of ore by trucks to Poro Point as a problem leading to the closure of the operation later during the war.

their vehicle pools. In the course of the war, however, all vehicles suffered heavily and became of little use except for the military. There were no replacements except those vehicles that the Japanese military had brought over to the country as a result of their military conquest. The remaining vehicles that were usable vehicles were reconditioned and repaired as far as possible. But lack of fuel, the scarcity of parts and the lack of replacements told on the usefulness of private motor vehicles.

Practically all the buses and other transport vehicles were initially taken over also by the USAFFE and used during the retreat. During the occupation, some public utility auto lines were reopened. But motor transportation throughout the country rapidly deteriorated. Spare parts and rubber tires could not be replaced. An acute shortage of fuel developed. As time went on, the only fuel that could be used was alcohol or charcoal, gasoline becoming unavailable.

The impact of the transport crisis was felt most in Manila and in other urban centers as well as in inter-provincial travel. Initially, streetcars and horse-drawn vehicles were the only means of transport. Usable automobiles had been commandeered by the military. Shortages of parts rendered most of them inoperable. The few taxis before had become even fewer. Only a small number of buses and trucks became operable. As a result, tricycles became more widely used while bicycles became the mode of travel for those with personal vehicles

Communications

Communications infrastructure in 1940

Modern communications in 1940 consisted of the telephone, telegraph, radio, and mail service. These were the standard means through which various people, businesses, and government conducted business with themselves and the outside world. The development of these modes of communications gradually improved in the Philippines, to a much larger extent than in other areas colonized by the Western powers on the eve of World War II.

The Philippine Long Distance Company (PLDT) owned the franchise for providing telephone service. The franchise included radio and telephone communications overseas as well as between the large cities of the Philippines, as is the case even today. The fixed telephone lines of the PLDT were over 32,000 telephones connected within a length of telephone service that extended 131,000 kilometers of lines. Fire and dynamites destroyed the two principal central offices of PLDT in Manila. These two centrals housed more than 60 percent of the telephones in the city. In addition, the underground conduits and cables throughout the city were badly damaged. In addition, the government operation a small telephone service operated by the Bureau of Posts. This accounted for about 464 lines at the outbreak of the war.

There were 108 radio stations allowed to operate before the war. They were scattered around the country, and of course, those operating in Manila were more substantial. Globe Wireless, RCA, MacKay, and the Philippine Press Wireless had transoceanic service.

Mail service was one of the major public services provided by the government before the war. By then, the infrastructure for the buildings of the mail service was well organized, and the Manila Central Post Office built across the Pasig River sandwiched by the Jones and Sta. Cruz bridges was among the most beautiful buildings in Manila.

Organized communications in the Philippines was virtually paralyzed by the onset of the war and this continued over time. The Electrical Communication Bureau of the Japanese Army was given charge of restoring the communications infrastructure. This was likely mainly to enhance the military aspects of communications. Restoration of telegraph, cable, and postal services was restored as soon as practicable.

Telephone and Telegraph

The military structure, through the Electrical Communication Bureau, took over and operated the PLDT facilities that could be put still in the service almost immediately. In the same way, the telephone exchanges that were in operation by the same company in Panay, Negros, and Cebu were likewise taken over. Wherever the occupying military captured centers of government, the telephone system, however

small, was a target of takeover. Communications systems were vital for the prosecution of the war and the organized guerilla resistance, recognizing this, tried to sabotage or disrupt most of them.

Restoration of telephone and telegraph service was hampered by an acute lack of wires. The destruction of some part of the systems impaired full return to service, and lack of wires and of other spare parts grossly limited what could be put to use. But one of the consequences of the public disorder following the war was the prevalence of looting. No replacement of wiring supply could be acquired under the war conditions especially when shipping had become tight. As a result, the repairs were confined mainly to important centers of population and activity.

But telephone and telegraph services were made to serve the military purposes as a priority. The Japanese military claimed that service of radio, telephone and telegraph had been extended and maintained with the larger Japanese empire – Manchuria, China, Hong Kong, Korea and Taiwan.

An indication of the state of communications was probably demonstrated by the efforts to put the government communications line in service as soon as possible. The Commonwealth government had a telephone line with 464 units in 1940. By July 1943, only 66 of these were announced as being opened. Intelligence on this point surmised that no more than 100 offices of the government could have been connected by telephone by the time of the proclamation of the puppet Republic in October, 1943.

Radio

Little information on radio communication was reported regarding the 108 radio stations that operated before the war. The Japanese restored those radio stations with great military value and left the rest of the system to be undertaken under the auspices of the Philippine government. Only the Globe Wireless was refitted for service by the Japanese military.

Of the four broadcasting companies – KXRN (50 KW), KZIB (1 KW), KXHF (1 KW), AND KZRH (10 KW) – only one was put under complete rehabilitation and, perhaps, expansion. This was KZRH. American intelligence had concluded that this station operated with three short-wave transmitters. Two of these were for broadcasting within the country, both using the call letters, PIAM. The other was used for broadcasting to North America under the call letters PIRI. Under the same station was a medium-wave transmitter relaing under PIAM. Another unidentified Manila station – still, considered part of the KZRH network, relayed directly to Tokyo, especially using Japanese language transmissions on medium-wave.

Communications was a vital part of the propaganda war. One medium wave transmitter was located in Davao and another suspected to be located in Cebu. Medium wave translations were also suspected to have been installed in Iloilo, Legazpi, Tuguegarao, Cotabato, Zamboanga, Cagayan, and Baguio.

Mail service

Reopening of postal service was undertaken until sometime after the occupation, but under strict censorship. Reopening of the service began in Manila and was gradually extended to other provincial capitals and large towns. Old postage stamps were made usable, but new postage were printed. Money order and postal savings services were gradually restored.

Two years after, by January 1943, only 100 post offices were announced as being in operation by the government. By October of that year when the puppet government was born, a total of 422 post offices were reported opened. If this was the case, this was only about 40 percent of the number of postal offices in operation before the war. It was believed that a total of 45 percent of prewar mail post offices were operational by January of 1944.

Public utilities in energy

The enemy property custodian of the Japanese military command took over the Manila Electric Railway and Light Company (MERALCO). The Taiwan Electric Power Company was placed in charge of producing and supplying and producing all the power needed in Manila, Davao and other important

districts in the country. MERALCO's hydroelectric power plants located in Caliraya, Laguna (which was near completion by the time war broke out and was completed by the Japanese in July 1942) and in Botocan, Laguna became the main source of electric power for Manila and its environs. In order to conserve fuel, the steam plant in the region was used less and was relegated to supplementary generation.

The government restored the use of the Tarlac steam power station in July 1943. The Japanese authorities tried to put emphasis on the exploitation of water power in order to conserve other industrial fuels from use. Such plans were emphasized in Mindanao. As the war progressed, American intelligence apparently could not get sufficient information about the conditions of the power plants in use.

Production sectors

Under a climate of reduced foreign trade, the notion of self-sufficiency became the motto for economic survival. Production was designed to cover the needs for major commodities for which no imports of goods or of the raw materials for their production existed. This meant reliance mainly on domestic production, the enhancement of domestic replacement for imports of goods and of raw materials. In many cases, the drop in production was inevitable, and reliance mainly on existing inventory of goods, personal belongings and business inventories were the means for meeting demand.

The production sectors traditionally cover agriculture, industry, and mining. Many of the infrastructure and public utility sectors already discussed had their production activities, for they produce services. At a time of the destruction following the start of hostilities, a lot of capital assets were destroyed and they brought with them a fall in the output of their services.

Reconstruction, repair and efforts to recover lost assets meant an increase in productive activity. Since most of the discussion had been largely through intelligence accounts and reports of expatriates, the above reports were in the nature of anecdotal evidence and were not obtained from official records on which it would have been possible to build indexes of output. No such indexes could be constructed for the amount of repair and for the amount out output. Wartime was not the most propitious time to undertake record keeping.

The amount of shipbuilding and repair must have been relatively massive because of the priority set by the military needs. But such output as shipbuilding represented was probably never able to recover the amount of services that was destroyed with the loss of shipping capital as a result of destruction during war time. The same was true of construction activities that tried to replace ruined infrastructure. So, from these accounts, the fall in output arising from the loss of infrastructure capital must have swamped whatever productive gains were made in the area of reconstruction and restoration.

Agriculture and Industry

Food Production: Rice, Corn and Other Products

Food was plentiful during by 1940. Agriculture for food production was varied. And whatever supply of food staples that was in short supply due to production could be made up by imports. The earnings from other commercial agriculture more than made up for any import needs, when food like rice and corn was inadequately produced from domestic farms. Under wartime conditions, importation of food would become impossible, not only because of the fall of export earnings but because of lack of logistics and the problems of defense.

Soon after occupation, the Japanese authorities announced the plan to make the country self-sufficient in food crops. They then embarked initially on various projects. The Japanese introduced the cultivation of the *horai* variety of rice. They built demonstration farms totaling 364 hectares (900 acres). They distributed unoccupied arable lands to landless farmers with occupation of them guaranteed for five years. They made free distribution of seeds and some agricultural implements. They provided some agricultural experts from Japan. They promoted vegetable gardening. They encouraged meat and dairy production. And they extolled promotion of fishing.

These attempts fell far short of their aim. The food situation became scarce and critical as time went on. As a result of the confiscation and forced sale to the Japanese of farm output, farmers reduced their production. As time went on, production mainly for home consumption became prevalent. Stocks of rice as could be obtained in the market was distributed in Manila and other urban centers, but food prices went up. Price controls had been instituted to stabilize prices, but these even made food prices more scarce and much of it was transacted in the black market.

The National Rice and Corn Corporation (and later, its successor as the grain agency, the Bigasang Bayan or BIBA) undertook its purchase of rice centrally in part to supply it to the urban centers but also to act as supplier of the needs of the occupying military forces. It was reported that no more than 10,000 tons of rice was imported during the Japanese occupation. The meaning of this was that with supply of harvest relatively falling, the civilian population was poised for mass starvation if the war lasted too long.[9]

People planted more vegetables as the scarcity of food created more pressure to provide made supplies own home consumption especially as the war period dragged on. Fish that was relatively plentiful was hampered by lack of fishing vessels and by the poor state of land transport. But for the most part fish became a staple of dried fish. It was also supplied for the needs of the occupying army.

The government realized that the food situation was getting to be more critical. In this context, the established a Food Administration Office for the purpose of controlling the distribution of rice and corn and the cultivation of available lands for food production. The government also appropriated money for improving irrigation and made great efforts to encourage the people to increase food production.

Food distribution however was further aggravated by the deteriorated condition of the public infrastructure and the transport system. This problem raised the cost of food supply in the cities, their principal market destinations. Inadequacy of transport aggravated food supply where it was needed and further fed into the inflationary spiral affecting food prices.

Moreover, capital goods available for farming fell in number. The number of draft animals became scarce as some of these were slaughtered to provide food. The cutoff of imports of meat products that was once plentiful and affordable before the war led to the substitution of local meat from the slaughter of some of the work animal population. Another factor was the dwindling of the amount of seed material for the succeeding crop seasons. Moreover, war conditions further fomented social unrest in the farm and fueled greater uncertainty.

Sugar

The sugar industry in 1940 was one of the mainstays of Philippine export trade. The sugar output was sold mainly on demand stemming from the United States market where it received favorable prices. It was sustained by the presence of a large capacity of sugar mills, some very modern, at the time. There were forty one sugar centrals in operation at that time. The economies of central and southern Luzon and the islands of the Visayas (mainly in Negros and Panay islands) were highly dependent on sugar. A total of 194,200 hectares of land were planted to sugar in that year, but the peak ever produced during a boom year when freer trade also existed with the US had reached 305,890 hectares planted in 1934.

The war literally obliterated the main market for Philippine sugar in the United States. Japan had little use for the excess sugar output and had wanted to reallocate land for other industrial uses. A large number of Japanese technicians and agricultural experts came to the country to draw up a comprehensive sugar production plan. This was originally designed to reduce the hectarage planted to cane to 60 percent of prewar levels. Twenty percent of the cane output was earmarked for local consumption and 40 percent for the production of fuel alcohol. Land that was freed from sugar was to be diverted to the planting of cotton crop (see below).

There was a military objective in this plan. The authorities ordered the sugar mills to manufacture high grade fuel alcohol and placed them under Japanese management. Immediate operation of the mills was

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[9] Hartendorp (1953) commented often on the food situation and the measures that the government undertook to avoid its worsening. Jose (1999) also traced the measures undertaken, to no avail, to avoid a worsening rice situation.

made possible on the basis of sugar stocks, most of which was confiscated, which amounted to one million tons. In addition, there was a considerable amount of molasses for the purpose.

The planting of the sugar crop, however, was mainly based on ratooning the harvested canes, thus allowing secondary cane stand from the ratooned cane. This was more inefficient as a method of planting increased the amount of cane impurities and therefore required a larger tonnage of raw cane to produce the same amount of refined produce.

The production of alcohol as fuel was a desperate move to substitute gasoline imports, partly to conserve fuel and partly because of the difficulties of bringing in imports of gasoline to prosecute military objectives. The need to raise alcohol output caused a revision of the original plans. For instance, the military authorities had to maintain the hectarage of land to produce sugar cane. They therefore abandoned the plan to divert 40 percent of the land to cotton production. Also, the sugar that was intended for domestic consumption was also diverted for military use and production for alcohol. This reduced the availability of domestic sugar. The population was made to depend for their supply of sugar on musovado and other low-grade sugar produced from small mills. The supply of sugar that used to be allocated for the use of industries depended on sugar distilleries were also diverted for the production of fuel alcohol.

Naturally, these efforts led to the reduction of sugar cane output. Annual production of sugar was estimated at 200,000 metric tons. One fourth of this output or 150,000 metric tons was converted into some 75,000 metric tons of ethyl alcohol.

Coconut Products

The long term gestation and relative permanence of standing trees for production made coconut production relatively stable despite market changes that proved disastrous to farmers. Output remained relatively high for the standing crop that was hardly affected by the war. Productivity of coconut output – given the standing nut-bearing trees – mainly depended on the care of plantations (barring bad weather and disease). Aside from weather and disease, the natural enemies of the coconut trees were the advancing weeds and jungle, which during wartime became a problem.

But the economic market for coconuts changed in composition during the war. Before the war, there were 10 big dessicated coconut factories, 18 coconut oil factories. The war dislocated many of these factories, and output was reduced to a small fraction of prewar output. There were eight large mills that took in copra for processing. Only four of these mills became operational during the war. Thus, output was reduced to a small fraction of prewar output. The operation of the large coconut oil mills was placed in the hands of the Japanese.

Whatever output of coconut oil for domestic use was used as fuel or lubricant. Some 25 tons of coconut oil was used as fuel for the Manila Gas Company. Products such as glycerine, soap, lard and margarine was derived from coconut chemicals derived from coconut oil. Much of that output was utilized for the use of the occupying army. Domestic home industries were set up partly to substitute the normal supply of these products that disappeared in the market as a result of the war and the scarcity that it engendered. Coconut oil was also transformed as fuel for lighting as the war period became more severe and the scarcity of energy became more severe. The relative price of copra fell because the export markets were lost except some that was available in Japan. Transport – critical to the movement of copra to the mills – became limited and expensive as the months progressed, making it harder for output output to rise.

The coconut industry however was a major boon to the people. In the absence of significant industrial uses, it found its use as a major food item again. During the penury and low food supply of later years of the occupation, the coconut became a more frequent food for human consumption. It must have saved a lot of people from actual starvation and death. The *castaniyog* – or roasted coconut meat – became a popular food because of its plentiful supply and its affordability. It replaced roasted chestnut or *castañas* – a delicacy of prewar times among the well-to-do Filipinos before the war. The supply of coconut was not as badly diminished as other food items. In a sense, without the coconut tree, which produced its nuts continuously during these hard days of occupation, many Filipinos would have starved during the war period.

Abaca and Cordage

The Philippines was one of the world's largest suppliers of rope and hemp products before the war. The Japanese military took over and operated four of the largest rope factories. For several months, the country's inventory of some 21,000 tons of abaca became the raw material for these factories. Supply of hemp from Davao and from the Bicol region was prevented by paralysis in transport. To overcome this problem, the Japanese announced that it planned to transfer the Johnson Picket and the General Manufacturing rope factories from Manila to Davao. The rehabilitation of the Manila-Legazpi rail line made possible the flow of abaca from the Bicol region to the other two factories in Manila.

Marine cordage was a strategic war material. It seemed that the acquisition of the Philippine supply met the marine cordage and fish net requirements of Japan from the manufacture of abaca hemp. About 10,000 metric tons, or 10 percent of abaca hemp production, was processed in the country. The rest of this supply of 90,000 metric tons was shipped to the factories in Japan mainly from the port of Davao. Davao had become a steady source of supply of abaca for the rope industries of Japan before the war. A thriving colony of farmers had settled in Davao and developed the abaca industry into one of the most important industries of Mindanao during the earlier decades of the American period. A settlement of Japanese farmers cultivated fertile lands for abaca in Davao and the results of those prewar activities were successful.

Domestic requirements of abaca, such was the weaving of abaca cloth for sacks and clothing, slippers, rugs and other particles were turned over to the Abaca and Other Fibers Corporation of the Philippine government. But this was a secondary need. Abaca hemp was valued highly for the making of marine rope of durable quality.

Cotton

Cotton received special attention as a major industry to be developed in the Philippines by the Japanese administrators.[10] An ambitious five-year plan envisioned the Philippines becoming a major grower of cotton. The strategy was to convert 40 percent of farm lands devoted mainly to sugar amounting to 92,000 hectares into cotton growing farms. The projected areas covered lands in Luzon (Batangas, Bulacan, Pampanga, Bataan, Tarlac, Pangasinan, and La Union), in Visayas (mainly Negros) and in Mindanao (Cotabato). This was partly a measure of adjustment from the loss of sugar market in the US but it was also a developmental program designed to introduce an important industry. Early efforts to set up cotton growing and a nascent industrial textile industry had already commenced in the country, but the scale of the new program was massive.

The occupation authorities assigned Japanese cotton growing companies to provide expertise, supervision and resources to implement the cotton development program. Around ten companies were particularly active in this role.[11] Initially the authorities wanted to involve Filipino firms to be part of the cotton growing, but this failed to materialize. The authorities adopted contract growing as the main method of undertaking plantings under which the Japanese firms supervised the local farmers in the culture of the plant and bought the raw cotton from them. The cotton companies from Japan formed themselves into a Philippine Cotton Cultivation Association.

The program was also hopelessly optimistic. With only a limited horticultural experimental background in the Philippines, the agricultural plans for cotton growing was based on confident assessment of the possibilities and were not in consonance with what was then known about cotton experiments in the country. The times were not propitious for such intense efforts, in part because of the war time uncertainties and of actual reluctance of landowners and farmers to accept a new crop that quickly. The cotton growing association imported cotton seeds of different varieties (some for experimental purposes), free distribution

[10] This section on cotton, while dependent on the intelligence report on which much of the economic survey is based, benefited further from the detailed essay of Nagano Yoshiko (1999), which described the cotton production program under the Japanese rule.

[11] These companies were: Daiwa Boseki Co., Kurashiki Boseki Co., Toyo Menka Co., Kanegafuchi Boseki Co., Kureha Boseki Co., Toyo Boseki Co., Toyo Takushoku Co., Taiwan Takakushoku Co., and Dai Nippon Boseki Co. See Nagano (1999).

of these seeds with carabaos to Filipino planters, grading and fixing of prices for cotton as an incentive to production. Most of the areas where the plantings took place were from the sugar areas and some from lands previously devoted to upland rice cultivation.

These efforts failed to achieve their targets. Eventually, the program itself required modifications to adjust to the realities. The problem in part was the relative newness of the cotton growing program. Expectations about suitability of land and other problems related to the culture of the plant were initially optimistic. Experience with cotton growing would take time to cultivate, and climatic and soil conditions were natural conditions that needed to be tested against experience and suitability of varieties. For instance, heavy storms in affected Central Luzon farms that destroyed half the cotton fields in 1943. Moreover, with food becoming a major problem during this period, the allocation of land to cotton conflicted with food growing.

Part of the strategy for cotton agriculture was the expansion of the textile industry. The Philippine textile industry at the time of occupation was a fledgling. The hopes for a strong cotton farming bases did not suit the economics of land use. It was, however, a major challenge for industrial development to harvest domestic cotton and feed it into the raw material needs of an expanded textile industry. The importation of second hand textile machinery from Japan took place. The plan was to create three-shift systems in the textile plants. Active participation of Japanese textile companies in this industrial plan involved the expansion of looms and spindles that were not needed in Japan.

The problem with these plans was that as the war went on, transport of industrial machinery from Japan could not be implemented due to the shortage of ships. Even assuming that the cotton program succeeded in raising cotton supply for the textile mills, there would be a crisis of under-capacity in textile production. The cotton growing essentially failed, with some promising outcomes in output in some of the cotton growing areas. It was a major issue whether cotton growing could become a major agricultural undertaking with comparative advantage, but the answer to this question could not be made during a war time economy of experimentation and forced growth.

Logs and Lumber

The occupying power seized the stockpiles of lumber available in the country soon after the war. These were used in military construction, especially repairs to bridges destroyed by the retreating USAFE forces. Sawmills belonging to American and British citizens were taken over and operated by the military. The seized mills provided sufficient capacity for the current war requirements of Japan in terms of Philippine hardwoods. This included the lumber for building wooden ships as well as for military use. Filipinos and Chinese owned some smaller 150 sawmills and logging establishments.

Despite apparent freedom given to these operators, their output suffered tremendously due to uncertainty and the difficulty of getting log supply due to the lack of transportation facilities. Production of lumber fell acutely, especially in Manila. The result was an extreme lack of lumber supply.

Tobacco and Cigarettes

Before the war, the country was a major producer and exporter of cigars. Domestic production of cigarettes was also a major industry. The domestic cigarette manufacture was mainly for domestic consumption but cigar production was mainly for export. Long before, Manila cigars were well known.[12] The military authorities imposed a government monopoly of the industry. The supply of Virginia-type cigarettes was imported from the United States before the war.

The major cigarette factories using Virginia-leaf tobacco were taken over and operated by the Japanese military soon after the occupation of Manila. This included tobacco leaves that were in stockpiles. Such inventory provided sufficient material for the seized factories to operated in limited scale.

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[12] When W. Somerset Maugham, an English writer of renown, first met literary and therefore financial success at the turn of the 20th century, he reported that he luxuriated in Filipino cigars, among other things that he had indulged in. Maugham (in one of his memoirs), *The Summing Up* [1938, Penguin edition, p. 68].

The military administrators created the Philippine Tobacco Leaf Association in order to control the supply and purchase of tobacco as well as the distribution of labor within the industry. To promote improvement in production, the government raised tobacco prices by 60 to 70 percent higher than prewar prices.

Yellow-leaf tobacco seeds from Japan were imported into the country and the production from them was reported to be successful by the military authorities. In October 1943, machinery for cigarette making transferred from a factory in Shanghai and installed in Manila to boost output. The supply of cigarettes was a major consumption need of the army. This explained the high importance placed on mild cigarette production by the Japanese military administrators. This preference deviated from the orientation of the Philippine tobacco and cigars industries as it specialized in the production of strong native cigarettes.

The production of the cigarette factories remained under control of the Japanese. The supervision of the Philippine Tobacco Leaf Association was turned over to the Ministry of Agriculture and Commerce of the Philippine government after 1943.

Fuel, Lubricants and Other Strategic Industrial Materials

Before the war, fuel supplies were mainly imported from Indonesia (then the Netherlands East Indies). Fuel that was imported consisted mainly of coal (362,000 tons), coke (4,600 tons), diesel oil (417,000 tons), gasoline (2,262 million liters) and kerosene (991 million liters). Only military needs were met from imports after the occupation. As a result, fuel became very scarce. Domestic coal supply that was known and which was being mined from local sources was inadequate and of poor quality (see discussion of mining output below). Increasing domestic supply of import substitutes for fuel was urgently needed. Alternative domestic sources of fuel were a major concern. Aside from coal mining and the completion of hydroelectric power plants already referred to (see discussion of energy under an earlier section), agro-industrial industries provided the basis for raising fuel.

The two export industries – coconut and sugar – were designed to play big roles in the production of alternative fuels. The conversion of coconut oil into fuel gas was a major effort in relieving the supply of lighting and cooking. The conversion of sugar into alcohol – gasohol – was discussed. The coconut industry residues of shell provided a basis for making charcoal. Husk was additional fuel. Utilization of native firewood (especially mangrove) and bagasse from sugar cane milling provided fuel for trains and industrial plants as well as for home cooking. Coconut oil provided also lighting substitute for kerosene through the invention of lamp based on that fuel. None of these efforts compensated fully for the standards that the population enjoyed during the previous peacetime ear.

In the case of lubricants or heavier fuels, the same efforts at substitution of domestic products and processes were undertaken. Lubricants were mainly supplied from the United States and Indonesia before the war. Coconut oil, again, was the resource mainly used to replace lubricants. A process for deriving a special lubricant from coconut oil was put to use. The potential for lubricant production from vegetable oils was widely known but the presence of hydrocarbon sources made that process unattractive before the war. Under the stress of wartime scarcities, such methods could be put to use. It was said that the process from coconut oil and other vegetable oils could lead to as much as 50 percent extraction for fuel recovery.

In addition, the Japanese administration tried to propagate the production of castor oil. A five year plan was started to plant around 15,000 hectares and to provide free seeds to farmers for the purpose. Impatience for this program led to an acceleration of the campaign eight months later. A revised program called for a three-year planting program. The program was a failure like in the case of cotton. Farmers could hardly make ends meet trying to undertake the supply of food, and little news about the castor oil program planting was known later as time passed.

Other important chemical supply needs of industry before the war were met significantly with imports and a limited level of domestic production. Some local factories supplied about half of the Philippine needs for paint and a smaller supply for varnish. Much of the demand for pigments and a large proportion of oils used was imported before the war. In the case of fertilizers, about 35,000 tons was imported mainly from the United States.

Before the war, lumbang oil supplied the country with about 400 tons of oil as a substitute for linseed oil which was imported. Pigments of standard quality were not available, and cheap substitutes for these were being used, including the use of titanium. The domestic supply of paints and varnishes really was not enough to meet the need for paints and varnishes despite reopening by the Japanese military of the Elizalde Paint and Oil Factory in early 1943 to relieve the local demand.

In the case of fertilizer chemical, domestic supply nearly disappeared except those that could be had from natural sources. Signs of the deterioration of usage of fertilizer – and the consequent reduction of productivity of agricultural output – were that the cultivation of sugar and that of other major crops did not use fertilizer as an input. In 1943, the Japanese authorities announced that fertilizer supply would be augmented by the importation of artificial manure from Japan and by the setting up of local factories for the manufacture of copra, bone mean and guano into fertilizers. Reports of intelligence did not get confirmation or news of the progress of these efforts and the extent to which they were applied.

Miscellaneous industries

Confiscation of assets and the operational take over of the industries or firms were methods applied by the Japanese military to help them prosecute the war effort in order to take control of vital supplies and inventories. Among other known plants that were taken over immediately after the occupation of Manila included such well-known factories as the San Miguel Brewery, Magnolia Ice Cream Factory, the San Miguel Cold Storage Plant, the Philippine Cold Stores, the Manila Gas Companies and two large shoe factories. The operations of these plants continued under military control even as the Philippine government was made to resume under the puppet Republic.

Less vital factories and industries were transferred to the Philippine government. This included those factories that produced mainly for domestic consumption that did not contain any significant implication for military supplies.

Mining Industry

The mining industry in the Philippines developed having Japan as a major market.[13] For this reason, there was great awareness of the importance of the Philippines as a source of strategic minerals long before the war happened. During the late 1930s, the mining industry enjoyed rapid expansion. The dollar devaluation that took place in 1932 created a huge incentive for the expansion of gold mining. An outcome of the gold boom was the increase of non-precious metallic mining – iron ore, copper, manganese, and chromite – which were highly strategic industrial materials for Japan's military industries of the time. These mineral outputs were sold in large quantity to Japan before the war.

The Japanese military gave mineral operations a high priority.[14] Efforts to put back some important mines in the service of the Japanese military were undertaken to exploit the mines that were active at the time. Some of the mineral companies in the Philippines were partly owned by Japanese interests, in view of their role as buyers of the product. For instance, before the war, Lepanto Consolidated Mining Company in Benguet had 21 percent of its stock partly held by three Japanese companies. Iron mines in Paracale in Camarines Norte involved minority investments Japanese interests.

The Japanese strategy in the mining sector was to designate Japanese enterprises to undertake the lead in developing mineral resources. Three copper mines at Mankayan in the Mountain Province, Rapurapu in Albay, and Antique, the chrome mine at Masinloc, Zambales, manganese mines in Guindorman, Bohol and in Busuanga islands, and iron ore in Kalambayangan, Camarines Norte were mentioned as priority operations.

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[13] This section on the mining industry further benefited from the paper of Ikehata Setsuho (1999) on the Philippine mining industry during the Japanese occupation.

[14] According to statements in the document, the reports on the mining industry depended heavily on the intelligence supplied by Dr. Bain, who was the adviser of the Philippine Commonwealth government on mining industry matters. He apparently pieced the intelligence on these matters from his familiarity with issues and from radio broadcasts that he helped to monitor.

It seemed that forty-two mines were examined and assigned to different companies by the Japanese military. But not all of these were actually developed during this time, as there were problems of immediately taking operational control.[15]

Remarkable efforts were exerted and, for a time, relative success was accomplished, in three major mining operations, two of them in copper mining and the third in iron mines.[16] Difficulties in operating the mines were due to wartime conditions that prevented sustained and successful results. First was the problem of repairs of damaged mines. Restoring some of the mines was a challenge. Lack of machinery to replace damaged mines meant that some machinery – power equipment and other machines – could be reallocated to priority mines. The cannibalizing of capital assets to support activities in other mines was used as a means of upgrading or sustaining capacity in the favored mines. For instance, the gold mines were abandoned in this way, their machinery dismantled and moved to mines of higher priority like the copper mines.

Then came the problem of maintenance of security of the plant and workers from guerilla attacks. As the war progressed, this became more a problem. Logistical issues arising from the scarcity of transport was a serious problem. The ores could be mined, but the transport of the mines to ports was a problem. In time, ore inventories could pile up and no movement of output could be made. Many of the destroyed mines suffered from the flooding of the tunnels, the disuse of some equipment and their consequent rusting in flooded tunnels. The problem of securing and maintaining labor to keep the mines in operation with adequate labor became a serious problem as the war progressed. This was true of unskilled and skilled workers.

The lack of shipping played a major role in the inability of the Japanese military to exploit the mines. In cases where ore could be mined, there was the danger of stocks building up and remaining useless. This also meant lack of revenues for the produce.

Where it was possible to undertake mining, the importance of security could not be underplayed. This permitted the concentration of some mining activity. In the case of copper, for instance, consolidation of mining activity was made possible by focussing on the exploitation of a single mine. Expansion of the mining through this consolidation required the installation of additional machinery. In such cases, transfer of machinery from other mines made it possible to expand mining output. Increased mineral output posed the problem of transportation, since moving output from the mines to the port of shippment required also transport access.

Gold

The Japanese tried to operate the Mambulso Gold Mine in the Paracale region, where gold and copper was being extracted. This was abandoned but the United Paracale was operated for its lead mines. Power houses and mills of gold mines had been stripped of their generating equipment, tools and spare parts and used for other purposes, including transfers to some other mines. Diesel engines, crushing machinery, and other equipment of the Baguio and Suyoc mines, for instance, were transferred to the Lepanto Copper Mine at Mankayan to enlarge mining efforts there.

The gold mines were neglected by the Japanese but not by intent. There was helplessness in the situation. The mine tunnels were destroyed or abandoned shortly after the occupation had begun. But aside from stripping some of the gold mines in favor of other mineral resources, the tunnels also got flooded when the rains came. This state of flooding ruined whatever existing machinery and equipment that was left with the mines.

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[15] Table 2 of Ikehata (1999) listed these mines by type of mineral resources, location, the name of the companies thus commissioned, the date of that commissioning and the branch of the military in charge of the commissioning.

[16] Helpful information on these three mine operations is incorporated in Ikehata (1999). These mines were the Mankayan copper mines in the Mountain Province, the Antique copper mines, and the Kalambayangan iron mines project in Larap, Camarines Norte, discussed in the text below.

Iron and nickel

Keen interest in operating the country's largest iron mines at the time at Larap, Camarines Norte. Experts and technicians were sent to the mines and these were put into operation. Known as the Kalambayangan mine operation by the Japanese, there were 26 shipments of iron ore from these mines from 1942 to 1944 to Japan which amounted to 210,000 tons.

In the case of nickel, much was believed to be for future exploitation of well-known deposits in the country. Japanese engineers and metallurgists investigated the possibilities of nickel and iron mines in the Surigao region. No active mining had been reported. The mines in Samar, Marinduque, and Paracale were not activated.

Much of the problems of mining – aside from the alternative uses for power equipment for military purposes which invited their transfers to other military uses – was discouraged by the lack of transportation equipment. Shipping shortages were acute and no amount of mining could move the ore out of the mines.

Manganese and chromite

About 15 manganese mines were in operation before the war with an average annual output of 58,000 metric tons and a total estimated reserve of 180.000 metric tons. The Japanese had wanted to exploit these mines but apparently with no success during the period of the war. The reason was that stockpiles of 80,000 to 100,000 metric tons of manganese was available in the country. Because of shipping problems, these inventory was not fully utilized for shipment out of the country.

In the case of chromite, stockpiles of this mineral were also in the amount of 100,000 metric tons. This had been shipped out to Japan immediately after the occupation. The mines of Acoje Mining Company and the Filipinas Mining Company in Zambales provided high grade chromite. The combined output and reserves of these two mines had were 76,000 and 300,000 tons respectively. Four other deposits in Zambales had 13,000 high grade chromite ore. One large deposit at Masinloc produced 72,000 metric tones of low grade ores. The minerals provided by these two mines enabled the shipment of more than twice as much chromite as Japan had obtained from the Philippines in 1940.

Copper

In 1940, the Philippines exported 2,000 tons of copper to Japan. This would experience a huge expansion of the copper output. The Japanese military seized the Lepanto Copper Mine at Mankayan, Mountain Province almost as soon as they were able. They developed this mining facility into the largest copper mine in the Far East, outside of Japan. Transfer of mills and power equipment for neighboring mines (see gold) made it possible to raise the treatment of ore to 1,500 tons daily. There were still plans to raise this capacity. The goal was to set the daily tonnage to 5,000 tons. But this was apparently considered technically impossible for those days. Moreover, the annual production could not exceed 18,250 tons of copper at the maximum. This meant working around 2,000 metric tons of ore. Such an output would represent about 15 percent of the current Japanese supplies of copper by 1944.

To expand the mine output, it was necessary to construct additional transport infrastructure. Mention was already made about the branch railway line from San Fernando to Sudipan in November, 1943. Likewise, the Japanese were to build an aerial tramway from the mine down to the last terminal of the railway line. However, it seemed that the transport logistics came to transport of the ore, both raw and refined, by trucks down the road to the port, which meant exposure to road conditions. For instance, during the peak of the copper operations in 1943 before conditions began to deteriorate further, of the 402 vehicles controlled by the Mankayan mine, only 52 could be employed to transport the copper concentrate to Poro point. Eventually, concentrate stock piling rose to 3,400 tons. Insufficient fuel and lubricants, plus danger to vehicles during transit to port, hampered the operations until it was forced to close in July 1944.

Three copper mines were located in Antique, Sipalay, and Pilar-Capiz. Efforts to restore operations in these area failed, but the one in Antique was a relative success. The Japanese managers from Ishihara Sangyo were able to rehabilitate the mine, but encountered trouble at about the time of completion due to serious labor problems related to security. The success of ore mining was short-lived, although the

target of 19,000 tons of mining was reportedly completed. The operations suffered the same fate of closure as transport scarcity led to stockpiles of mined copper at the mine, leading to closure by November, 1944.

Coal

Coal was already discussed in connection with energy. At the beginning of the war, some imports of 7,500 tons of coal was made from Taiwan (then Formosa). No further coal was reported to be imported during the course of the occupation.

To exploit the known but limited coal deposits of the country was an important objective. But like the other mining projects, coal suffered from operational problems related to logistics of manpower and of transport. The Batan Island off Legazpi, Albay was a source of coal. It was believed to produce some 25,000 tons per year. There were deposits on Polillo and Catanduanes Islands, but these were not known to produce large outputs. There were numerous small deposits in Cebu.

The output of coal was quite limited and certainly inadequate. Throughout the war, the production of firewood and charcoal was undertaken in part to supply the need for fuel, as described already, to help alleviate the extreme shortage of fuel.

Finance, Banking and Prices

Financing the Government

Taxation and Borrowing

The Japanese military administration immediately continued the system of tax collections based on the sales tax law under the Commonwealth. This called for a collection of a 35 percent tax on articules of luxury, 30 percent on merchandise, and 10 percent on imports and exports, but excluding the articles belonging to the Japanese armed forces from taxation.

Because of the fall in foreign trade, the main sources of taxation fell essentially on amusements, manufactures, professions and business licenses. Great difficulty was encountered in tax collections from all the existing sources.[17] Additional incomes of the government were derived from the sales of the National Sweepstakes and the sale of government bonds, in short, proceeds from borrowings.

The Japanese military authorities issued military notes in order to cover its expenditure. This printing of money were made as advances for procurement and were also extended to the Philippine government (after its creation) to cover budgetary expenditures. These were of course budget deficits.

Banking

Three Japanese banks were in operation during the war. Two of these – the Yokohoma Specie Bank and the Taiwan Bank – already operated in the Philippines before the war began. These were reopened with stronger deposit mandate. Some 15 million pesos of the Philippine (Insular) treasury were confiscated and deposited in these two banks. The Southern Development Bank also began operation. The latter was designed to finance Japanese industrial and commercial enterprises through the local banks.

All foreign banks were turned over to the Taiwan Bank and were put under the process of liquidation. These banks were the National City Bank of New York; Nederlandsch-Indische Handelsbank; Hongkong and Shanghai Banking Corporation; Chartered Bank of India, Australia, and China; China Banking Corporation; and Bank of Communications. Enemy aliens who had deposits in these banks were allowed to withdraw against their deposits a maxium of 200 pesos on authorized occasions.

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[17] A potentially rich source of future research was how the government financed its operations during the war period. Records of these fiscal revenues and expenditures should at least be available in the government reports of the time. Such fiscal records could further help to shed light on the economic issues.

Of the Filipino-owned banks, the Philippine National Bank, the Bank of the Philippine Islands and the Philippine Bank of Commerce were allowed to reopen at the beginning of 1942. Japanese loans totalling approximately 25 million pesos were made to these banks to enable them to reopen. In October, 1943, the Japanese authorities ordered all local banks, except those under liquidation, to transfer all American and other national deposits, to the Bank of Taiwan. Any credits due these enemy nationals were to be paid in Japanese war notes. In this way, the values inherent in any deposits became exposed to the loss of values from the war notes.

Other Philippine banks were not allowed to reopen as quickly since there was lack of cash to provide them liquidity. These banks in the second category were the Agricultural and Industrial Bank, the Philippine Trust Company, the Monte de Piedad, People's Bank and Trust Company, and the Banco Hipotecario. By 1944, the Agricultural and Industrial Bank and the Monte de Piedad were allowed to reopen. Banks were allowed to operate under their own directors and officers, but with Japanese advisers.

Under the Philippine republic government, a plan to set up a central bank was broached. Not much happened in this direction however.

Currency

In preparation for the possibility of invasion, the Japanese military had already prepared large quantities of military notes ranging from one centavo to 20 pesos. Upon entering Manila, these notes were put into circulation. They were issued as legal tender for all transactions, with severe penalties for refusing to accept them as such, also prohibiting the use of the US dollar but allowing the Philippine peso to continue to be used. The notes were printed on poor quality paper, without serial number until after August 1943. The amount of war notes put in circulation through payments for requisitions were so substantial as to force the rapid loss of value of the peso currency (See further discussion in Part IV, the concluding part in relation to the analysis of the wartime inflation).

Soon after the occupation began, silver and fractional coins disappeared from circulation. This put a premium on these coins for possible future use or even melting for metal. A premium of about 40 percent for old Philippine notes existed by June 1943, and the premium price rose within months to 100 percent, some even said up to 600 percent. The same black market for the dollar currency also rose, especially as prospects for Japan's defeat became possible. This meant a heavier premium for the scarce currency.

Prices and Price Control

Prices rose as the occupation proceeded. There were no price indexes to record the inflation, but by the amount of currency needed to buy the same amount of necessities, the extent of the price inflation was widespread, especially towards the later years of the occupation.

Price controls, food rationing, and a variety of regulatory edicts to conserve food were resorted to as soon as the war began. The government's efforts to set up price controls – through price ceilings – and through the control of industry and commodity associations to help modulate or reduce the price inflation could be reviewed with the efforts to set up all kinds of business associations that were designed to carry out this program. In this way, control and retail distribution agencies were set up: the Daily Necessities Distribution and Control Guild, the Cattle Milk Control Association, the Philippine Salt Control Association, the Liquid Fuel Distribution Association, the Food Control Association, and the Association for the Distribution of Drugs and Medicines.

In addition, there were government agencies that were given specific tasks to distribute, ration, and implement price controls. The National Rice and Corn Corporation (NARIC), an organization inherited from the prewar organization, increasingly became a tool for rationing rice. By January, 1944, its credibility had been so low that the government had to abolish it and establish a successor agency doing the same thing, the Bigasang Bayan or BIBA. By then, the rice situation had become unmanageable. Rice became harder to find in the open market, despite higher prices. But it was heavily traded in the black market. BIBA's quick failure and loss of credibility led to another change of rice distribution office, which meant the birth of the RICOA, or the Rice and Corn administration.

Thus, desperation in food supply and the increasing price inflation for necessities pushed the government in undertaking measures that merely relied on organizational changes being undertaken to undertake tasks that were impossible, because food supply was becoming more scarce.

Social and Other Economic Conditions

The overall condition of the economy was inexorably taking place, with production of food and other products falling precipitously and supplies becoming scarce. The compensating increases in economic activity in some sectors – where these were occurring – were not enough to forestall the fall of total output. By how much this total output had fallen – some measure of overall GDP or national income – is addressed quantitively in the next section. This drop of production in specific sectors of agriculture, mining and industry, plus the general lack of employment among the population, the scarcity of goods and of food in general aggravated the social and economic conditions.

The total output had definitely fallen. The composition of that output basket drastically altered by the economic position of economic sectors and those persons who used to be active in those sectors. The destruction or the low level of usability of some infrastructure facilities impaired the overall production of the various sectors of the economy. For instance, even if some sectors did not initially experience destruction, the impairment of transport facilities and other infrastructure caused bottlenecks to develop that would eventually affect the production and efficiency of these sectors.

A consequence, of course, is the large lay off of laborers from productive work. The destruction of some capital reduced immediately the demand for labor in those industries where no future activity could take place any more until new investment materialized. The replacement of destroyed or depreciated capital never took place fully. A consequence of that was the inability to absorb the former labor that was employed before.

No statistical information on employment was available. But the extent of the visible unemployment that multiplied in the cities, the extent of unemployment was very high. Even the employed suffered tremendous loss of income in view of inflation and the reduction of economic opportunities for the industry.

Wartime conditions made labor conditions not only volatile but also poorer in quality. On the one hand, there was the bulk of the labor force that needed to seek work in order to gain a living. The economic collapse of many enterprises through destruction, closure, confiscation, and general economic standstill made work difficult to find and caused an impoverishment of many families. Some of the city folks found their way back to the provinces, to spend the time in less threatened social circumstances in the city. In most cases, any work undertaken was at an extreme sacrifice of living standards based on the prewar expectations.

Lack of employment and the scarcity of goods caused enormous growth of informal trading activities in the city. Personal goods and assets were recycled and became items of merchandise, thus providing temporary commercial employment and monetary liquidity for many people. The restoration of civilian government provided continuing employment for those in the government sector. The "buy-and-sell" trade raised the level of activity for many unemployed people through the enlargement of trading gains from the same amount of goods available on hand.

The growth of subsistence agriculture, even within city plots, became a common activity, although subsistence agriculture in the farms helped to occupy labor in some productive work even though they experienced reduced output because of the lack of capital implements.

The enterprises favored by the military authorities for strategic reasons often encountered, especially as the war progressed, labor problems. The supply of labor often fluctuated in numbers. The example of the mining operations, already described above, indicated that they had enormous problems maintaining their labor to work in the enterprises. Where security of operations was kept tight, labor hires could be kept for some period of time. Some of these laborers stayed in part because they felt intimidated to work. Examples in the mines indicated that some element of forced labor, or forced hiring, was rampant. Escape from work was dealt with severity.

In the mining operations, Japanese enterprises that needed labor often used tactics of securing the assistance of village leaders to recruit labor from the community. Often, this worked well, especially in areas where there was not a well-defined guerilla unit operation. But as time went on, few areas of the country were immune from the opportunistic attacks of the guerillas on company operations. This often dissuaded workers from continuing their employment in the company.

The unsettling experiences from interruptions caused by guerilla actions on the field made labor employment in the mining operations difficult. The case of Mitsui Kozan, operator of the Mankayan copper mine, advertised its labor needs in the Manila Tribune newspapers several times for the employment of engineers and laborers demonstrated the enormous openings available many grades of skills.[18]

War prisoner labor was used by the military in various economic activities. Prisoners of war were partly used to keep the rehabilitation and mining work to continue, at least in the case of the mines in Antique and Larap mines, others in agriculture (in some cotton fields), and in public works repair and maintenance. Without the stable source of labor, many such operations would have closed much sooner. The Japanese authorities also undertook to supply labor to highly important activities, for instance, the maritime industry through incentives in wages to recruits and through organized efforts at recruitment. At times, such efforts were supplemented by forced labor arrangements, from among neighborhood associations in which identified persons were made to join work gangs arranged by the military. In some situations, many of the workers were made to undergo agricultural work in some areas of the country.

IV. Assessing the Economy's Condition by the End of the War

In this final and concluding section, the focus of discussion is to analyze the economic conditions by the time the war ended. Any commentary on the economic consequences of the occupation period on Philippine economic development is postponed. That topic – profound and requiring much more time for reflection – is postponed for a future occasion.

The Second World War formally ended on September 2, 1945 with the final defeat and surrender of Japan. But months before that finality, the occupation of the Philippines had already practically ended. The last major battle of the war in the Philippines was the liberation of Manila. American forces landed five months earlier in the islands in October 1944, in Leyte. The war ended with the Philippines badly ravaged. Beyond the lives lost or changed forever, the experience of battles and conflagration added more economic damage towards the end of the war. The fierce battles for control during the end games of the war, especially in Manila, further contributed to the destruction of a large amount of public infrastructure and private property. The economic losses would have been astounding still even had the devastation of Manila been spared. The years of occupation had brought about pernicious effects because of the continuing depreciation if not destruction of economic and human capital as the three years of occupation wore on.

Documentation of the war damage could be pieced from various sources. The sketchy recounts of sector economic activity before and during the war as described in Part III of this paper were the best available that could be put together until today. Some of these accounts were in the nature of speculation since they were pieced together from second hand intelligence, however reasoned and expert. Direct statistical records were difficult to come by. In those extraordinary times, official records of the government or of private industries or of the military dispensation were not adequately kept or monitored. Evaluation of operational operations was definitely not an art practiced in wartime. Quick count and results were often not noted. And even if those evaluations were ever undertaken, war destruction took care of records that would have been kept extant under normal times. The public memory of those times from many individuals and writers were plentiful and oozed out from memoirs and accounts of both heroism and of deprivation.

Historians such as Agoncillo recounted many florid anecdotes of the war, but he had no hard facts rooted in statistics.[19] Most of those who kept records of the war preserved their personal memorabilia and

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[18] See Ikehata (1999), pp. 142-3.

[19] For instance, see Agoncillo (1965), chapter 11, pp. 475-554, vol. 2 [2001 U.P. Press edition]. The description of the times involved accounts of anecdotal quotes supposedly said by real but unidentified people, partly to indicate the humor, pathos, or realities of the economic aspects of the occupation.

the government documents that marked their involvement in the war. But the operational records of agencies and the usual project reports are not referred to or cited. It is from operational reports that statistics get compiled. The *Filipiniana* section of the U.P. Library, for instance, has kept the compilation of documents of the Japanese military administration.[20] They include the tomes that were in the nature of the official gazette documenting the official decisions and actions of the government. But it is the operational reports of the government and of firms that often give more information about how the economy fared. It is a challenge for economists and economic historians to unravel the recorded history from extant historical records and papers of prominent officials and persons of the times.

Accounting for the Decline in Output

The economic survey prepared by the United States Economic Survey Mission in 1950, known otherwise in the country as the Bell Report, which was undertaken to prepare a postwar aid program to the country, provided information that helps to quantify the devastation. (See Table 2, in the Statistical Appendix). The output of food products in 1949 appeared to have recovered by 1949. Palay production was 5 percent higher than the 1940 output, and corn was even much higher. Root crops had not fully recovered. And meat and poultry even less so. The survey mission had only recently then benefited from the construction of the national income accounts which were initially calculated as part of the mission of the economic research department of the newly organized Central Bank.[21]

The output of the economic sectors and the standing capital stock of the economy – what could be measured directly – indicated how bad the situation had come to be by the end of the war.

Take, first, the production of food. During the first crop year after the war, in 1946, the area under cultivation was sharply lower than the 1940 areas under cultivation, all across the food crop categories. In fact, total areas under cultivation had not recovered even by 1949. The same story, but worse compared to food crops, was the situation of the export crops. The perennials among the export crops – coconut and abaca – did not fall in hectarage as drastically. There was however no replanting. And most of these plantations had been neglected to the weeds and other jungle growth. Sugar cane hectarage suffered a catastrophic reduction. Nearly 90 percent of the prewar hectarage was not planted in 1946 and recovery would not be total by 1949.

The case of livestock and poultry indicated the reduction of meat supply during the war. The number of livestock suffered great reduction during the war. Total livestock was 37 percent of the 1940 level. The people were forced to slaughter livestock during the war. The proportion of the diminution was worse for cattle and for hogs. But carabaos were 46 percent of the prewar stock. By 1950, the livestock population was still 84 percent of the prewar population.

Viewed in per capita terms, these statistics conveyed greater hardship for the people. In 1940, food produced domestically was in general insufficient for the population. But it was at a fairly high level of availability due to production and supplies from imports. Moreover, export prosperity increased the food budget for domestic consumption. Imports of food supplemented the nation's diet. But during wartime, the country was reduced to self-reliance on the ever-dwindling supply of food.

Before the war, around 19 percent of total imports supplemented the domestic food supply. The per capita figures for 1949 (when the population was 19.6 million, or already 3 million more than the prewar level of 16.6 million) showed that food production was still way below the 1940 levels, except for corn. One can deduce from this that the food supply by the end of 1945 was staggeringly low. Even while food production had fallen badly, the food supply for the populace was further aggravated by the diversion of part of the available supply of food to feed an occupying army of soldiers that numbered between 100,000 to 200,000 troops at its peak. There was no way to import food to supply domestic consumption

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[20] See the University of the Philippines Filipiniana section on "Japanese Occupation Papers in the University of the Philippines Collection," typescript, no date.

[21] See Central Bank Department of Economic Research (1958). The work was initially carried out under the technical assistance component of the work of the Joint Finance Committee, which recommended the creation of the Central Bank and of the Statistical Center of the University of the Philippines.

needs for lack of vessels and due to the shipping blockades. Another evidence of food scarcity was the severity of inflation for food items (to be discussed elsewhere, below).

Of course, it was not only food production that had been hit. The experience was endemic to all of agriculture, and worse for some sectors that stopped production essentially, like the mining industry. The sectors that used to produce large surpluses for exports had all suffered enormous cuts in their earnings and in their output. Forced changes in asset ownership through confiscation of enemy property and destruction of standing assets and inventories of goods reduced much of the incentive for production at the onset of the war. Price controls – along with heavy penalties for transgressions – were in force, and these measures took a toll in the reduction of total output. In those areas where the Japanese authorities tried to take over the control of production and transfer that responsibility to their favored parties – namely, appointed Japanese firms or their partners – they found great difficulty pursuing the targeted level of activity that was planned. In time, because of other scarcities, these especially positioned enterprises would also close their operations.

During the more than three years of occupation, the earnings of the export industries practically fell to nil, except those for which some trade with Japan could create substitution of the former prewar external trade. Under wartime occupation, exports of goods to Japan were undertaken mainly in the form of accounting prices, largely without hard revenues made in payment for them. The Philippines was also used as a source of supplies for other parts of the "South" meaning the push of the Japanese military to points south of the Philippines, especially during the early part of the war. No record of the volumes of these exports is available, however. The Japanese military authorities could simply pay with military notes their requisition of supplies taken from enterprises, the population and the government. The process proceeded along the lines of confiscation or nominal payment for the goods using newly printed money, not hard foreign exchange.

Total export trade before the war probably accounted for at least one-quarter of total output. This trade fell precipitously by 1942 with the loss of shipping and of the markets of America which accounted for more than 80 percent of exports. By the last year of the war, foreign trade was inconsequential. Domestic output of all sectors fell as a result of the destruction of much capital goods. In agriculture, the capital goods was vital in improving investments in land, and this also therefore reduced land use as a factor of production.

In 1940, total exports exceeded imports by about 36 million pesos ($18 million)[22]. During the prewar period, exports could finance all the imports with even a surplus to account for. Since all imports would be practically reduced and exports would practically disappear during the last years of the war, the economy's trading capacity was practically hobbled. Moreover, it lost a sizable amount of imports which provided raw materials including food for the domestic economy.

The economy's production capacity was quite low during the first full year of the post-liberation period. For instance, during the 1945-1946 planting season, traditional exports of agricultural products were very low compared to the levels of 1940.

Centrifugal sugar production amounted only to 12,837 short tons from five active mills. By the next year, 1946-1947, when 16 mills would have been rehabilitated to process sugar, output would rise only to 85,000 tons, only enough to begin to cover domestic demand for sugar. Abandoned sugar fields were made to remain idle except for the plots used to help in food production for survival.

Copra would have been plentiful, because the nuts of the huge standing trees in the islands would bear fruit unimpeded, but the sad state of the coconut mills and dessicated coconut mills would restrict output. Secondary growth and weeds ravaged the abaca plantations after their abandonment to the elements towards the end of the war. Mineral output practically stopped by the end of the occupation as the mineral operations had stopped for want of shipping and for want of lubricating and fuel supply.

For the rest of the productive sectors of the economy, there was general decline on a massive level, compared to the prewar economic activity. The state of capital equipment in existing prewar industries was very destitute, with many of the surviving equipment unable to run due to lack of lubricants and fuel. The state of factory and commercial buildings was in a very bad condition of neglect and

[22] Using a multiplier factor of 15, this is equivalent roughly to US$260 million in current dollars.

uselessness. Where there was progressive agriculture in large plantations, land essentially laid fallow and weeds and uncontrolled growth had taken over land that used to be in a high level of cultivation. Exception was in those areas where food production for home consumption took place. And these were essentially in patches where it was possible. Irrigation systems that were in use before were in disrepair for lack of maintenance and other raw inputs.

The case of imports was hard to track down. Goods imported by the military occupiers often consisted of strategic raw materials and of course supplies and military equipment for the occupying forces. Reports of imports of fuel, lubricants and other finished materials naturally happened in the course of the war, especially when control of the high seas were with Japan. But there were no records available of these equipment and goods.[23] The search naturally for this type of accounting would be in relation to those working on military history of the war for which the main stories were about battles and victories rather than how logistical and economic support worked out. In some instances, producer goods were brought into the country in association with economic programs, such as those for cotton growing and textile machinery, were based on announced claims and project plans through the propaganda machinery. There was also some element of imports that were clandestine by the very nature of war: goods brought in to supply the anti-Japanese forces through the guerillas by the Allies to boost the military subversion of the occupation.

The economy that Japan tried to transform to serve the latter's military objectives was unable to perform that task except minimally and with resistance. That all efforts were made to gear it for military production was made clear by the various efforts to take over vital industries. Confiscation and use of forced labor when necessary were instruments of undertaking economic recovery and pursuit of output objectives.

Failure to undertake full economic mobilization came from two ends. First, a large segment of Filipinos could not return to normal economic operations as an expedient reaction to the uncertainty of the war even if enterprises had not suffered loss of capital. Second, organized guerilla resistance against Japan increased as the war progressed. The guerilla units were able to undertake sabotage of economic and military installations. There was an active belief – which grew stronger as the war dragged on – of the possibility of defeat of the occupying power. This further strengthened the resistance against fuller cooperation.

The open economy in 1940 of the Philippines enjoyed one of the highest standards of living in Southeast Asia. This economy was reduced to being dependent on its own productive capacity through the war years. It became largely a subsistence economy under complete autarky, with relatively unused or badly damaged capital stock. It was an economy forced to help sustain an occupying army and whose agriculture was inadequate to maintain the relatively large population because of the destruction or disuse of capital.

This author's reasoned guess from all this discussion is this. Easily, after the first two years of war, total output had fallen by more than one half of the output before the war (1940). That was calculating up to the end of 1943. The fall in output continued as a result of additional destruction and measures undertaken by the military authorities. The year 1944 involved a further deterioration of output. With the additional destruction brought about by the war for liberation, a further decline of economic capacity took place. A conservative estimate of the decline in output all put together was that the end of the war output by the beginning of 1945 was perhaps 30 percent of the level of the 1940 output.

The real volume of output during the immediate prewar years and the years following the end of the war, from 1946 to 1949, can be examined (see Table 3, in the Statistical Appendix). This author rebased the physical volume of production as reported in the Philippine production indices to 1940 from 1938 (the original base period). The total output index (something akin to an index of the GDP today) had not fully recovered from the 1940 levels by 1949, a full four years after the war had ended. Agricultural output was the quickest to recover, but in 1949, this was still about 5 percent short of the output level of 1940. Industry was a full 81 percent of the 1940 level. And mining was growing fast, but had not yet

[23] The exception is that after the war, as companies and individuals undertook to present their claims for war damage payments, they presented their claims of war damage losses in the hope of being compensated for war damage under the United States War Damage Commission. These estimates are summed up in Part IV of this paper.

reached 30 percent of 1940 output. In 1946, the total output was only 35 percent of the 1940 output. Agricultural was 60 percent; manufacturing was 18 percent of its former output. And mining was practically nil.

Analyzing the Wartime Inflation

The inflationary experience was severe. But no full account of the inflation is available from any extant statistical series. To get a partial accounting of the inflation, one has to work with data of the prewar and postwar periods. This is undertaken now (see Table 4, this appendix).

The prices of goods entering the price index before the war were compared with the record of prices on June 30, 1945, when price statistics began to be monitored officially again.[24] This date was about two months after the liberation of Manila, but the war was still going on in the Pacific. By this time, the legal tender had already been changed to the prewar money in use. Old pesos and Victory notes, including US dollars, where already in wide circulation and the Japanese military notes had become without any value. The postwar peso was then exchanging at 2 pesos to the US dollar, the old prewar exchange parity. More important, civilian relief agencies from abroad (UNRRA) had already been operating to distribute various food items to alleviate the hunger of the people. Huge purchasing power had begun to be pumped in with the pay of the US military leading the way.

Most necessities (rice, charcoal, beef, chicken, bananas, cooking oil, salt and soap) were in the price multiples of 8 to 10 times the prewar prices. The overall basket of current household needs was 7.3 times the cost of the same prewar basket. Clothing and transportation were 10 times more. These prices were still not normal for the times, as the period of 1945 to 1949 was essentially one of falling prices. The important point conveyed by these price statistics is that these were post-Japanese occupation prices and that they were large multiples of the prewar prices. Such high prices were bridges to the much higher prices that had built up during years of extreme scarcity for common necessities.

The price inflation during the Japanese occupation was very severe. It was aggravated by the use of military notes to pay for war goods and requisitions that the Japanese military needed from the domestic economy. These military notes were decreed as legal tender. Initially made equivalent nominally to the prewar peso, as the war progressed, the military peso notes practically disintegrated in value as the supply of printed money overwhelmed the available stock of goods. Midway through the war, the military note became 30 pesos to the old peso. The Japanese military authorities used inflation as the engine of resource mobilization for the state. It was the inflation tax that basically caused the dislocation of incomes. Those who produced current goods with value for exchange – like food and other necessities – were able to extract higher prices for their goods. And people with limited purchasing power had to rely on their possessions by monetizing these in order to buy the goods that they needed.

Hartendorp's account of the Japanese times give some indication of the levels to which prices of various necessities had risen, especially that of rice and other food items.[25] Official prices that were decreed by the government gave an indirect clue to the adjustments made by the government as it faced the inflationary situation. As in most cases, such prices decreed by the government were unrealistic and hard to implement.

In early 1944 under the new BIBA (Bigasang Bayan which succeeded the NARIC or the national rice and corn company, the government's grain distribution arm), the government could decree that a sack of rice of 44 kilos could be sold at 80 pesos after distribution costs were taken into account. But with the

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[24] These price data were derived from the economic survey component of the last annual report of the United States High Commissioner to the Philippines to the President of the U.S. This report was quite comprehensive and, luckily, analyzed the price situation and the transition from the war period to the grant of political independence in 1946. The US High Commissioner was the highest American official in the Philippine service during the Commonwealth phase of the transition. Before Commonwealth status after the Tydings-McDuffie law, the Governor-General of the Philippines was the highest government official of the United States in the country. This is the reason for the extensive reports of the highest US official in the Philippines when reporting about the developments in the country.

[25] Hartendorp (1953). See especially pp. 124-129; pp. 138-141.

disappearance of grain from the market, the government was forced almost as soon to fix the price of rice at a higher level – 200 pesos per cavan sack or 10 pesos a ganta (20 gantas to a cavan) or around 4.54 per kilo. These prices were far above the going price before the war when a ganta of rice cost 30 centavos (or 13.6 centavos per kilo).

Calculating the implied inflation rates from these data when set against the prewar base period, this represented index prices that were 3,333 percent for rice. At about the same time, the price for beef was 17 pesos per kilo (compared to the prewar price of 70 centavos). For sugar it was 30 pesos per kilo (compared to 12 centavos before the war). For a whole chicken, it was 18 pesos (compared to 1 peso before the war). Thus, the index price for beef at about this time was 2,429 percentage points compared to 100 in 1940; for sugar, 25,000 percentage points; and for chicken, 1,800 percentage points.

Times became harder as greater uncertainties occurred. In the case of rice, prices further moved up to from 500 pesos per sack shortly before the bombings of Allied forces of military targets took place in Manila 6 times to 3,000 pesos per sack. As Hartendorp put it (p. 139), "The black market price of rice, which had still been 500 a sack in May [1944] had risen to 3,000 just before the bombing and jumped to 5,000 immediately after. Sugar, which had been selling at 30 a kilo, jumped to 70 pesos..." These prices are translated into our price index calculations. The index price for rice moved to 8,333 percentage level compared to the prewar price base of 100 percentage points by the time the price of rice became 3,000 pesos per sack. This rose to 83,333 percentage points when the price of rice became 5,000 pesos per sack. For sugar, the corresponding price index was 58,333 percentage points when the price of sugar became 70 pesos per kilo.

Under these inflationary conditions, the turnover of trading transactions rose while the availability of newly produced goods fell. This is characteristic of inflationary times when output is swamped by uncertainty. The release of the supply of food items become subject to extreme speculation on stocks kept awaiting further price increases. Few tradables from new output were available. Instead much of the trading came from the inventory of personal wealth accumulated by people. The consumption exigencies of the times, mainly to protect their families from hunger, forced them to liquidate these assets in exchange for current goods. This consisted of personal belongings, economic assets of the rich and middle class in exchange for the opportunity to buy necessities. In such a setting, a great deal of income redistribution happened. Inflation took care of that.

Indirect information from currency that was put in circulation during the period further helps to substantiate the severity of the inflationary experience. In 1940, the amount of money in circulation was 200 million pesos. By the end of 1946 (one and a half year after June, 1945) and normalcy of the postwar was being anticipated, money in circulation was 889 million pesos. The transaction demand at a lower level of output was nearly five times higher than in 1941. The estimate of Japanese war notes circulated in Manila during the three years of occupation was between 6,623 million and 11,148 million pesos.[26]

The note issues were relatively moderate, at around 9 million to 10 million pesos per month during the first three months of the occupation. But these monthly issues increased to 16 million per month as prices rose and as the military authorities had to extract more output and resources from the economy. By the end 1942, the note issues amounted to 144 million pesos. By December 1943, note issues had cumulated to 480 million. The next year, by December 1944, the amount of notes in circulation had reached 1,000 million pesos. The debasement of the currency continued with further note issues as inflation fed upon additional note issues. The note issue in the month of February, 1945 was 1,300 million pesos. By July, 1945, the total notes in circulation reached the peak of 11,148 million pesos.[27]

This supply of currency abetted the rapid loss of value of the peso and the huge inflationary experience. Thus, taking the upper and lower range of these estimates, the amount of pesos in circulation at the height of the Japanese occupation was between 55.7 and 33.1 times the amount of money normally maintained during prewar days for monetary supply management. And yet, as this essay has now made clear, the amount of output had continued to decline during the same period so that the transaction demand for money rose fast.

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[26] Hartendorp (1953), p. 69.
[27] Hartendorp (1953), pp. 157-158.

During this period, the banking sector had become less functional as people depended more and more on cash in order to transact their business on a daily basis. As a result, the demand for liquidity was very high. Personal assets were sold for cash or were traded with commodities on the basis of barter, knowing that the value of the currency had been basically debased, especially during the later months of 1944.

The Philippine government was interested in determining the value of the peso at a specific base period in relation to debt and business transactions incurred during the severe inflationary times. A schedule of multipliers was arrived at,[28] which turned out to be equivalent to an accounting of the inflationary period on a monthly basis. Starting with a base period of 1942 for all months at 100, the index by January, 1945 was equal to 12,000. (See Table 5 and also Chart 1, Statistical Appendix.)

Accounting for the War Damage

Estimates that were undertaken about the amount of damage from the war involving, among others, the destruction of capital goods and loss of private wealth were made soon after the war. The Philippine Commonwealth government undertook a survey of the damage and arrived at an amount of 1.2 billion US dollars. Later, during the early 1950s, the Philippine government also produced another set of calculations in line with the reparations treaty negotiations with Japan that were even more large.

The United States government, through the War Damage Corporation, sent a mission to the Philippines to assess the war damage soon after the war. It undertook many surveys, block by block, of various regions of the country from province to province and including Manila. Based on sample reports that it received, photographs, and reports from local officials, the total estimate amounted to 708 million dollars. By regions of the country, such estimated damage add up to a total amount of US 798 million dollars (See Table 5, Statistical Appendix).

These estimates were calculated in terms of dollar values. In 1940, the US dollar had a much higher multiple value in terms of purchasing power compared to today's US dollar. In the context of sixty years ago, such damage was staggering. The dollar of 1940 is worth at least 15 dollars in current terms. It is important to take note of these estimates of war damage, ignoring other estimates of war damage such as those established for negotiations for war reparations.

Converting the corresponding values to current period dollars therefore, the losses would need to be multiplied by at least a factor of 15. This would mean something like 10.6 billion US dollars of 2003. Thus converting these into current 2003 pesos, this amounts to 584.1 billion pesos ($= 708 \times 15 \times 55$)[29] or over half of a trillion pesos. These are staggering numbers even when viewed in terms of relatively inflated current pesos. In terms of the 4.4 trillion pesos GDP in year 2003 (projected), this economic damage accounts to around 13.2 percent of GDP in current terms.

It was said earlier that the estimates of output were simply based on indexes of output constructed after the war by the national income accountants and rebased in this paper. Lacking the level of the GDP estimates in 1940, it is still possible to provide some rough estimates of the value of the damage on the basis of reasonable assumptions. The idea is to gear the estimates of the war damage to the total output for the year 1940, the benchmark used to compare wartime with prewar times.

The GDP of 1940 per head was definitely somewhat lower than the GDP per head of 2003, since national income reports have indicated a small, if not overwhelming, growth of per capita output on a yearly basis. It would be easier then to make an assumption that there had been no increase in GDP per head. Not only does this lead to a conservative assumption about the initial year GDP, 1940, but it leas to simpler arithmetic. Suppose then that the output of 2003 is just a fixed scale of the population increase.

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[28] By an expert, Mr. D. L. Ballantyne, special adviser to the Philippine Commonwealth president, who, together with other experts of the United States Treasury, applied their task to examine the inflation of the peso. See Hartendorp (1953), pp. 158-9.

[29] The calculation would have to adjust the US dollars of 1940 to the current dollar of today through the use of a multiplier that is equivalent to an inflator. The estimate of damage is multiplied by multiplier and then converted into current Philippine pesos. The nominal exchange rate at the time of rating is just about 55 pesos to the dollar.

The population of 2003, which is about 80 million Filipinos, is 4.27 times the population of 1940. Then, the denominator comprising the current 2003 GDP (as used in the measure above) would be simply 4.27 times the level of GDP in 1940. Thus, GDP of 2003 would have to be divided by 4.27 to calculate the implied value of the current GDP of 1940 (in terms of today's values). The result of that calculation is an estimate of total war damage being equivalent to 64.1% of GDP of 1940. This is an overestimate because of the conservative assumption of no increase in per capita output. The denominator, of GDP of 1940, would be higher than the actual GDP of 1940 when relative per capita growth of output is taken into account. Working backwards from 2003, the GDP of 1940 would then be somewhat smaller, to take into account the additional growth in per capita output. In short, the war damage level could have been more than 64% of GDP.

Carry this estimate a little further in terms of actual drop of total output resulting from the economic damage in order to extend the economic reasoning to a fuller conclusion. This now joins the final discussion of the subtopic, assessing the effect on total output.[30] Assume that the economy's capital output ratio during the period under study was equivalent to 2 – an estimate that says that two units of capital would help produce one unit of output. This is a realistic if not conservative assumption, given the relative stage of economic development at the time.[31] The assumption would be a requisite in arriving at some projection of output loss or contraction arising from capital loss. By taking the upper limit of 64% of economic damage ratio to the GDP of 1940, as calculated, for every year when output would have been theoretically measured, the decrease in output would be roughly equivalent to a reduction of output of 32% of GDP. (The calculation is to halve the ratio of damage to GDP as estimated.)

This result is somewhat higher than the estimate of output capacity by the end of the war. However, it should be remembered that this is a conservative assumption. Moreover, the cumulative level of capital destruction by the end of the war could have caused that drop of output as suggested – the level of GDP by 1945 being only around 30 percent of that obtaining in 1940.

From the discussion of this paper, however, it is known that the economic damage of the war was not imposed on the nation or on the capital stock in a single shot. It came in incrementally over the years of the war, even though the largest initial shock came at the beginning – the first year of the war – when hostilities began. But throughout the period of the war, there was a progressive decline of output because of the continued decline of the capital stock – through wear and tear and additional destruction of capital.

To summarize, by using intuitive knowledge based on the review of facts as discussed in Part III and further undertaking a review of the state of the economy comparing 1940 information and what could be derived from known data at the beginning of normalcy when economic data could already be measured, it was possible to undertake some qualitative and quantitative assessments of the economic effects of the Japanese occupation.

Using conservative assumptions about economic parameters of the period and around the Philippine economy, it is suggested that at the end of the war, national output was at least 30 percent of the level of the prewar output. In effect, total output in 1945 was 70 percent lower than that of 1940. Going to the estimate of the war damage in today's current terms (2003), the economic loss (not including human, of course) suffered during the war, using as base the estimate of war damage professionally undertaken at the end of the hostilities by American authorities, was equivalent to 13 percent of the (current) GDP of 2003. Translating this to the output of 1940 and using the most conservative assumptions, economic loss of capital from the war was 62 percent of the GDP of 1940. Since this economic damage to capital happened over time and not in a single shot but furthering the output loss as the war went on, these estimates conform to the assessment that Philippine GDP in 1945 – at the end of the war – was close to 30 percent of the output of 1940.

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[30] See above, the italicized remarks, in Part IV of this paper.

[31] Many highly developed economies would have capital output ratios exceeding 2. Capital accumulation explains much of the growth of advance economies, with increasing investment often accompanied by a deepening of capital so that the capital output ratio rises. Thus, a capital output ratio of 2 would be a conservative assumption at the time.

Appendix. Dates of Political and War Events

December 7, 1941 – Start of the Second World War in the Pacific front. Japan attacks the Pearl Harbor naval base in Hawaii. The United States declares war against Japan (and Germany) and enters the World War. Japan's attack on U.S. military installations in the Philippines was almost simultaneous [on December 8, Philippine time].

December 10, 1941 – Start of military invasion of the Philippines by Japanese land forces, in Lingayen, Luzon.

January 2, 1942 – Japanese military occupation of Manila begins.

January-March, 1942 – Japan's military administration creates a Filipino civilian counterpart called the Philippine Executive Commission composed mainly of officials left in the country by the Commonwealth Government to take care over the interim civilian affairs. Commonwealth President Manuel Quezon went into exile with a skeleton government with General MacArthur to avoid capture by Japan. Economic legislation and policy affecting the country was initiated or issued under the name of the Commission, which was under the Japanese military authority in reality.

April 9, 1942 – Fall of Bataan. General Wainright surrenders all the USAFE forces to the Japanese command unconditionally.

October 14, 1943 – Proclamation of the Philippine Republic under Japan, with Jose P. Laurel as President. Although independent in name, this was a puppet Republic subservient to the superior authority of the Japanese military.

November 12, 1943 – Amendment of the Philippine Constitution extending the term of the President in the presence of hostilities, through a resolution of the United States Congress (the term of Quezon as President having legally expired while the government was in exile).

August 1, 1944 – Manuel Quezon dies in the United States. Sergio Osmeña succeeds as President of the exiled Commonwealth government.

September 21, 1944 – Allied bombings of military targets over Manila and environs.

October 20, 1944 – American troops land in Leyte. General Douglas MacArthur and President Osmeña land on Philippine soil again.

January 9, 1945 – American forces land in Lingayen, Luzon to begin approach to Manila.

February 27, 1945 – Gen. MacArthur declares that liberation had been accomplished and turns over government to the Commonwealth.

February-March, 1945 – Battle for Manila's liberation.

June 1, 1945 – An American special technical mission from Washington D.C. leaves for the Philippines to determine the total war damage incurred in the country and assess potential liability of the U.S. War Damage Corporation.

September 2, 1945 – Formal surrender of Japan on board the *USS Missouri*. Actual capitulation took place on August 14, when the Emperor accepted unconditional surrender to the Allies.

April 30, 1946 – U.S. President Truman signs into public law two acts affecting Philippine economic recovery: the Philippine Trade Act (U.S. Public Law 371) and the Philippine Rehabilitation Act (U.S. Public Law 370).

July 4, 1946 – Independence of the Philippines is achieved with the birth of the Republic of the Philippines.

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Statistical Appendix.

Table 1. The Philippine Economy Before the War
Data were mostly for 1940

Description of Item	Unit	Characteristic
Population	**Number**	**16,577,000**
Educational enrollment	Number	1,944,569
Primary	Number	1,572,639
Intermediate	Number	277,574
Secondary	Number	90,579
Collegiate	Number	3,777
Agriculture		
Palay	Hectares	1,829,987
Coconuts	Hectares	1,051,215
Corn	Hectares	816,724
Abaca	Hectares	291,531
Sugarcane	Hectares	229,698
Tobacco	Hectares	57,921
Fruits and nuts	Hectares	190,538
Root crops	Hectares	180,573
Vegetables	Hectares	52,975
Coffee	Hectares	7,093
Cacao	Hectares	4,558
Cotton	Hectares	1,562
Rubber	Hectares	3,640
Other crops	Hectares	53,623
Manufacturing Output		
Sugar		
Centrifugal sugar	Kilos	947,067,288
Molasses	Gallons	36,842,827
Copra	Metric Tons	738,474
Coconut Oil	Kilos	243,012,761
Desiccated Coconut	Pounds	82,198,613
Rope	Kilos	12,277
Mining		
Chromite	Long tons	189,919
Copper	Pounds	20,014,918
Gold	Fine ounce	1,096,745
Iron	Long tons	1,221,126
Lead	Pounds	2,080,381
Manganese	Long tons	48,036
Platinum	Troy ounce	6
Silver	Fine ounce	1,394,736

Unit	Quantity	Value if Available
Output (cavanes of 44 kilos)	52,193,430	
Shelled corn (cavanes of 58 kilos)	10,038,340	
No. of bales	1,399,601	

Description of Item	Unit	Characteristic
Infrastructure		
Transportation		
Roads by class	Kilometers	22,960
First class	Kilometers	11,772
Second class	Kilometers	7,393
Third class	Kilometers	3,795
Motor Vehicles	Total	54,764
Automobiles	Number	33,898
Trucks	Number	20,236
Motorcycles	Number	630
Electricity Output (Meralco)	KWH (1,000)	175,381
Tonnage of cargo		
Manila Railroad	Tons per year	1,547,004
Communications		
No. of post offices	Number	1,050
Telegraph lines	Kilometers	14,607
No. of Radio Stations	Number	108
Telephones in service	Number	32,796
Length of telephone lines	Kilometers	131,158
Foreign Trade		
Exports	Pesos	305,320,153.00
Imports	Pesos	269,462,542.00
Balance	Pesos	35,857,611.00

Source: Bureau of the Census and Statistics. Yearbook of Philippine Statistics, 1940
Commonwealth of the Philippines

Table 2. Production of Food, Land Hectarage for Agricultural Crops, And Principal Exports, Prewar and Postwar (Units are indicated, where relevant)

Agricultural Production in Thousand Metric Tons	1940	1949	1949 Production Index 1940=100
Palay (Unhulled rice)	2,383	2,491	105.4%
Corn	272	534	196.3%
Root crops	615	524	85.2%
Fish and fish products	170	226	132.9%
Meat and poultry	237	165	69.6%

Agricultural Production in Per Capita Terms, in kilograms per head per year	1940	1949	1949 Per Head Production Index 1940=100
Palay (Unhulled rice)	142.55	127.17	89.2%
Corn	16.41	27.26	166.1%
Root crops	37.10	26.75	72.1%
Fish and fish products	10.26	11.54	112.5%
Meat and poultry	14.30	8.42	58.9%

Hectarage area under cultivation for principal agricultural crops (in Thousand Hectares)

Land Hectarage for Agricultural Crops (Thousand Hectares)	1940	1946	1949	1946 Hectarage Index 1940=100	1949 Hectarage index 1940=100
Food Crops					
Palay (Unhulled rice)	2,080	1,650	2,161	79.3%	103.9%
Corn	913	571	866	62.5%	94.9%
Fruits and nuts	201	186	203	92.5%	101.0%
Root crops	178	148	172	83.1%	96.6%
Beans and vegetables	49	30	49	61.2%	100.0%
Other foods	21	18	32	85.7%	152.4%
Total for FOOD CROPS	3,442	2,603	3,483	75.6%	101.2%
Export crops					
Coconut	1,051	960	965	91.3%	91.8%
Sugar cane	230	29	129	12.6%	56.1%
Abaca	292	271	283	92.8%	96.9%
Tobacco	58	27	29	46.6%	50.0%
Total for EXPORT CROPS	1,631	1,287	1,408	78.9%	86.2%
Total for ALL CROPS	5,073	3,890	4,889	76.7%	96.4%

Number of Livestock and Poultry (1,000 Heads)	1940	1946	1950	Index of Number of Livestock (1940=100) 1946	1950
Carabao	3,015	1,389	2,152	46.1%	71.4%
Cattle	1,396	443	735	31.7%	52.7%
Horses	343	151	222	44.0%	64.7%
Hogs	4,447	1,461	4,678	32.9%	105.2%
Goats	420	183	336	43.6%	80.0%
Sheep	40	19	29	47.5%	72.5%
Total LIVESTOCK	9,661	3,646	8,152	37.7%	84.4%
Poultry	27,775	7,535	28,386	27.1%	102.2%

Principal Export Products (Thousand Metric Tons)	1937	1949	1949 Export Volume Index 1940=100
Desiccated coconut	40.7	57.6	141.5%
Copra	236.5	528.7	223.6%
Abaca	165.3	62.4	37.7%
Coconut oil	871.0	415.0	47.6%
Pineapple, canned	163.3	61.3	37.5%
Chromite	80.8	40.4	50.0%
Iron ore	603.0	246.7	40.9%

Source: Central Bank of the Philippines and the U.S. Economic Survey Mission (Bell Mission) Economic Report on the Philippines, Washington D.C., Government Printing Office, 1950.

Table 3. Index of Physical Volume of Production, 1938 to 1949
Combined 1940=100

Year	Output Index	Agri-culture	Manu-facturing	Mining
1938	89.4%	87.0%	93.2%	78.4%
1939	85.0%	84.5%	84.4%	92.3%
1940	100.0%	100.0%	100.0%	100.0%
1946	35.2%	59.4%	17.9%	1.2%
1947	68.8%	81.1%	65.8%	10.2%
1948	77.9%	88.2%	76.3%	21.8%
1949	83.1%	94.1%	80.9%	29.8%

Source: Recalculated from the Central Bank of the Philippines data on Physical Production Index by changing Base Year of 1937 to 1940.

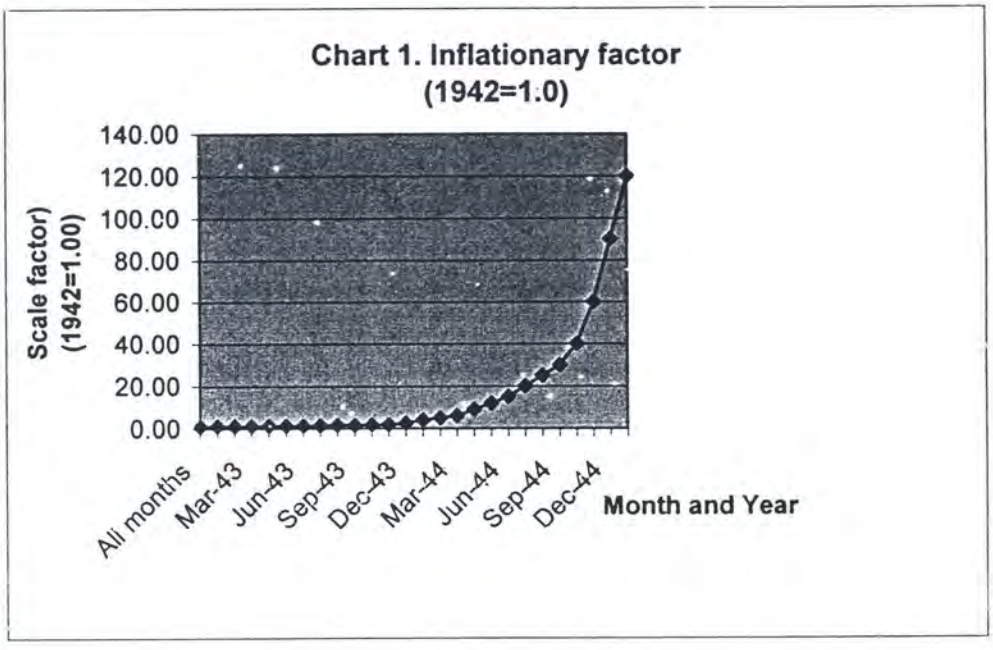
Table 4. Prices of Food Items and Other Necessities
Pre-War Price Compared to June 30, 1945
In Philippine Pesos

Item	Unit	Prewar Price, circa 1940	Price: June 30, 1945	Index Number Multiple (1940=1.0)	
Charcoal	ganta	0.10	0.80	8.0	
Rice	ganta	0.30	2.80	9.3	
Fish	kilo	0.30	5.00	16.7	
Beef	kilo	0.70	6.50	9.3	
Chicken	each	1.00	9.00	9.0	
Eggs	each	0.03	0.60	20.0	
Sugar, centrifugal	kilo	0.12	2.00	16.7	
Milk, evaporated	14 oz. can	0.16	0.16	1.0	
Coffee	kilo	0.12	2.00	16.7	
Camotes	kilo	0.09	0.20	2.2	
String beans	kilo	0.15	2.00	13.3	
Onions	kilo	0.15	16.00	106.7	
Bananas	per 100	1.00	8.00	8.0	
Vegetable lard	kilo	0.40	4.50	11.3	
Salt	kilo	0.40	4.50	11.3	
Cigarettes	pack	0.20	1.50	7.5	
Soap, toilet	cake	0.12	0.80	6.7	T
Men's shoes	pair	10.00	80.00	8.0	
Cloth	yard	0.30	6.00	20.0	
Components of groups					
Current household needs		99.40	725.60	7.3	
Clothing		11.83	124.00	10.5	
School supplies		1.50		0.0	
Transportation		6.00	60.00	10.0	

Source: Final Report of the U.S. High Commissioner to the Philippines, Washington D.C.

Table 5. The inflationary factor

Time	Scale factor
All months	1.00
Jan-43	1.05
Feb-43	1.10
Mar-43	1.15
Apr-43	1.20
May-43	1.25
Jun-43	1.30
Jul-43	1.40
Aug-43	1.50
Sep-43	1.60
Oct-43	1.70
Nov-43	1.80
Dec-43	2.50
Jan-44	4.00
Feb-44	5.00
Mar-44	6.00
Apr-44	9.00
May-44	12.00
Jun-44	15.00
Jul-44	20.00
Aug-44	25.00
Sep-44	30.00
Oct-44	40.00
Nov-44	60.00
Dec-44	90.00
Jan-45	120.00



Source: Ballantyne's schedule for indexing peso value of 1942. Quoted in Hartendorp (1953), p. 157.

Table 6A. Summary of Losses Due to War Damage and Number of Claims Stated (US dollars)

Owners of Losses	*Total Loss*	*Esimated No. of Claims*
Public Property	195,347,595.00	1,000
Catholic Church Property	125,000,000.00	100
Other Church Properties	14,000,000.00	15
Private Property	464,420,003.00	738,000
Grand Total	798,767,598.00	739,115

Source: US War Damage Corporation, cited in Final Report (1947) of the U.S. High Commissioner to the Philippines

Table 6B. Estimates of War Damage: Regions and Cities where Extent of War Damage

City	*Island*	*Area Damaged*
Manila	Luzon	50%
Cebu City	Cebu	70%
Iloilo	Panay	75%
Bacolod	Negros	35%
Zamboanga	Mindanao	90%
Davao	Mindanao	85%

Source: US War Damage Corporation, cited in Final Report (1947) of the U.S. High Commissioner to the Philippines

- End -