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Mobilization Theory: *Some Lessons from the Literature for Today*

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Abstract: Economists in the 1940s and 1950s faced a unique historical challenge: doing their part to ensure the victory of major war efforts all around the world. Tasked with guiding policy towards a successful full-scale mobilization of resources, these thinkers engaged in debate and theorizing around a 'mobilization economics.' However, this body of work fell out of academic consciousness as hot war gave way to cold. With the sudden urgency of the Coronavirus crisis, as well as calls for major mobilization returning to the political debate about climate change, this paper calls for the return of mobilization theory. It summarizes some contributions of the original mobilization economics, provides suggestions to update the core principles to fit contemporary circumstances, and suggests how they might be applied to both the pandemic response and a Green New Deal.

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With the 2020 novel Coronavirus outbreak officially declared a pandemic by the WHO, business-as-usual has come to an abrupt halt all around the world. Citizens and policymakers alike are being forced to briskly learn how to adapt to demanding and volatile circumstances. With harsh "social distancing" measures, a dramatic drop in retail demand, and a massive spike in demand for medical services, the economy is suddenly in need of serious re-tooling at a time when workers are being told to stay home. Calls to "mobilize"and to "wage war" against the virus are escalating.

In the background of the current pandemic, scientific reports continue to surface on the expected damage due to climate change. If it is true, as scientists suggest, that we have only 11 years to dramatically reduce greenhouse gas emissions before permanent severe environmental damage is locked in, then the implications for the economy are profound. Drastically curtailing emissions requires radically re-shaping our food, transportation, and shipping industries. To re-tool them to be carbon-neutral in such a short time will require an unprecedented level of productivity devoted to these efforts.

Our economy is not normally oriented towards combating looming existential threats, and certainly not two at the same time. It adopts slowly to change; it does not handle ultimatums well. To respond to the challenge requires us to re-think and to re-shape the economy. Most economists alive today are accustomed to studying this economy we have now, not a hypothetical one that is capable of meeting a looming existential threat. We need to mobilize our economy towards a singular purpose — survival — and we need a mobilization economics that can tell us how to do it.

Fortunately, this is not the first time the need for mobilization has arisen, and so there are templates available from which to learn: total wars. Nor is this the first time that scholars have turned their attention to the problems of mobilization, as previous wars have called for theorizing how best to

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manage these situations. During the 1940s and early 1950s, economists faced the challenge of making sense of a wartime economy, spilling considerable ink on that task. They expanded the field of "mobilization economics," which filled books, academic journals, and even some university courses (Codberg 1952, 113). However, by the 1960s, as cold war replaced hot, opinion shifted towards the position that mobilization was no longer relevant due to the belief that the next war would be fought with nuclear weapons and therefore would be over before there would be time to mobilize[1] (Kapstein 1989, 101; Kanter 1984).

Regardless, the topic of war mobilization has substantial value as a template from which to design a Green New Deal, and many useful lessons for that can inform the COVID-19 response. Therefore, I call for a revival of mobilization theory. I say "mobilization theory" rather than "mobilization economics" because a mobilization is not merely an economic project. It is a broader political, cultural, and social project. As such, it requires a transdisciplinary approach, which views each of these aspects within a coherent framework. I will first start with a review of key insights from the original mobilization economics, updating and synthesizing them for contemporary challenges as we go, before suggesting possible directions for future research.

Although thinking about war is as old as war, I will focus primarily on the WWII era, and particularly the early post-war literature which benefits from the hindsight of lessons learned. Furthermore, as this review is meant to inform mobilization for purposes besides total war, I will purposely attempt whenever possible to avoid language that unduly focuses on war or defense specifically, in favor of mobilization more broadly conceived. There is no reason that the lessons of war cannot be employed to create a better peace.

What is Mobilization, and What is Mobilization Theory?

Mobilization might be defined in contrast to peacetime social and economic conditions. Whereas in peacetime we tend to think that a market economy should be geared towards maximizing individual liberty subject to collective welfare and equity constraints, a mobilized economy is oriented towards maximizing public purpose subject to the constraint of maintaining individual liberty and equity as much as feasible. In a mobilization, society decides on a primary goal, which provides an overarching criteria for evaluation: all decisions on other matters must be compatible with that goal, or interfere as little as possible. The goal of course has historically been "to win the war," but a Green New Deal and the pandemic response obviously have different goals: with the COVID-19 response we aim to reduce mortality rate to the minimum while still providing the essentials for life; with the Green New Deal our collective efforts will be geared toward creation of new, more sustainable institutions and infrastructure.

[1] So much so that a book from 1966 entitled "The New Economics of National Defense" only devotes four pages to the topic of mobilization, which were largely used to argue that it would not be necessary (Clark 1966).

Neal (1942, 1-2) describes the role of the war economist as "determining how the means necessary for war can be procured and what effects the war will have upon the economic life of the nation." Substitute "mobilization" for "war," and we have the starting place of the mobilization theorist, however the latter should go further. While Neal (and the Council of Economic Advisers: CEA 1951, 507) argue that it is not the job of the economist to question the values that guide the need for economic mobilization, I suggest that it is indeed the job of the social theorist engaged in the broader transdisciplinary study of mobilization. Drawing on moral philosophy, political science, and legal studies, the mobilization theorist should be able to tell us why our proposed sacrifice is worth it.

Mobilization is characterized by heavy demands on society's resources. Besides vastly heightened government resource needs, there also may be reductions in resource capacity due to destruction from war (or quarantining of the labor force). Mobilization is thus associated with strong inflationary pressures, as there is large potential for conflict to ignite over who gets priority claim to those resources between various divisions in society, causing prices to spiral. A main focus of policy must be to prevent or mediate these conflicts in order to keep the economic machine running smoothly. Any and all resource reserves are put to work, and non-essential uses are subordinated to the collective effort — this will be especially challenging in the coronavirus response as our labor force is dramatically reduced due to quarantines. Because mobilization cannot happen without the consent and active participation of the masses, policy must also emphasize participation and fairness in order to keep morale up.

Mobilization is also associated with a temporarily much bigger government, spending large sums to procure resources necessary for the effort at hand. This is of course associated with a substantial increase in "red tape," and for that reason alone mobilization is likely to find opponents on "efficiency" grounds. But one must remember: mobilization is undertaken not because it is desirable in itself, but because society faces imminent danger that must be dealt with whatever the cost. Surely few would argue that we should not have fought World War II because it was "not efficient."

Mobilization Potential and Programming

The term "war potential" is used to denote "the capacity of any resource — geographical, human, capital, etc. — to serve a war purpose" (Neal/Killough/Taft 1942, 16-7). I mutate this term into "mobilization potential," and broadly use it to refer to the national capacity to mobilize. Fabricant (1952b, 22) highlights some important factors that determine mobilization potential: population, natural resources, capital goods, knowledge/skills, "the tastes and disposition of its people," and institutional capacity.

In order to mobilize, the nation must draw on all available sources of biophysical resources. The low-hanging fruit for increasing production of critical goods is to employ idle workers and machines, by moving the economy to full employment (Neal 1942, 5; Chandler 1951, 9; Neal/Killough/Taft 1942, 34-36; Fabricant 1952b, 21; Backman 1951, 11); this is likely to coincide with an increase in civilian production as well, which Clark refers to as the "more guns and more butter" phase [2] (Clark 1942, 4-6). Beginning mobilization with substantial underutilization of resources is a major advantage, as starting from full employment requires not just employing people looking for work, but also shifting workers from civilian production to mobilization employment, and, as explained in more detail below, requires living standards to fall at the same time that incomes are rising (Murphy 1950, 8-9; Chandler/Wallace 1951, 504). However, "full employment" might take on an expanded meaning, as patriotic and economic inducements can be offered, and regulations or customs relaxed, in order to encourage more working hours and attract people who wouldn't have been working into the labor force, such as students and retirees (Neal/Killough/Taft 1942,33; Wallace 1951, 30-31; Hart 1951b, 33; Chandler 1951, 9; Neal 1942, 5). Conversely, in the coronavirus crisis, we may face prolonged forced reductions in the labor force due to quarantines. This labor resource can only be tapped if it can be done in a way that doesn't aggravate the spread of the virus, by taking appropriate social distancing and/or PPE measures, or in cases where the necessity outweighs the risk.

After full employment of available labor is reached, finding additional resources for the expansion of mobilization output becomes difficult. Some increase in output, perhaps even a substantial amount in a long mobilization, will come from productivity gains, through innovation and learning on the job[3]; some resources can be obtained by allowing inventories to run down, and deferring maintenance and replacement of physical capital (Neal 1942, 7; Keynes 1940, 15; Chandler 1951, 9); if the country has reserves of foreign currency (possibly due to loans or gifts) or there's demand abroad for its currency, then the nation can supplement its own production by running a trade deficit (Chandler 1951, 7-9; Keynes 1940, 15; Neal 1942, 5); and some formalized production can be replaced with home production, e.g. the Victory Gardens of WWII (see Miller 2003). In the wartime mobilization, home production was effectively a substitute of leisure time for additional work, but in the virus outbreak home production might merely represent a redirection of labor supply to a different location.

But when these sources are utilized to their prudent maxima, other nonessential uses of resources will need to be cut in order for mobilization to continue (Chandler 1951, 4; Taft 1942, 69; CEA 1951, 518). Unrelated public works can be postponed and other non-essential government

[2] Once full employment is reached, Clark's next phase is one in which mobilization resource usage increases at the expense of the recent increases in consumption. In his third phase, "all-out war," mobilization demands increase such that consumption dips below its pre-mobilization level (Clark 1942, 4-6).

[3] Citing BLS data, Codberg (1952, 112), says that during WWII, every time production of a particular model of airplane doubled, there was also a 20-30% reduction in labor per unit. This is a substantial gain.

spending can be cut (Backman 1951, 34-36; CEA 1951, 521); private investment not needed for mobilization can be delayed or cancelled (Neal 1942, 5; Wallace 1951, 26). But ultimately, private consumption may need to be reduced, even if perhaps it had been rising in the early stages of mobilization (Neal 1942, 5; Beatty, 1942, 40; Keynes 1940, 2; Hart 1951b, 3; Chandler 1951, 4).

To the mobilization authority falls the task of "programming," defined as "the formulation of needed and feasible production objectives for the total national output and its components, scheduled over specific time periods" (Wallace 1951, 17. See also CEA 1951, 513-514). The mobilization program can be thought of as the sheet music that specifies the tempo and instrumentation for the mobilization, and the mobilization authority as its orchestrator. All aspects of the mobilization, including procurement practices and controls (discussed later) should be designed with an eye to supporting the goals of the program (Wallace 1951, 19-20).

The process of creating a program is as follows, as drawn from Wallace (1951, 20). First, the mobilization authority must compile details on the resource requirements of mobilization. This requires working with experts (military in the case of war, climate and energy scientists and engineers for a Green New Deal, and epidemiologists for the pandemic) to plot a timeline of output needs. Second, from these requirements must be calculated the physical needs in terms of raw materials and plant and equipment at each time step. Third, corresponding work must be done to determine what resources must be allotted to civilian needs. Fourth, from these schedules, the mobilization authority must prepare estimates of the required labor supply. Fifth, the actually available tools, materials, and labor power should be estimated, and compared with the required figures to identify possible shortfalls. Input-output analysis can be a useful tool for these endeavors, although it possesses well-known imperfections (Fabricant 1952, 59-62). Once the program, or alternative sets of programs, reach this stage, they must be "tested" for "feasibility" and "balance."

A program must be "balanced" in both a macro and micro sense. That is, it should ensure "first, a proper ratio of [mobilization] to civilian production and, second, proper proportions within each of these two major classes of goods" (Fabricant 1952, 54), avoiding "a relative undersupply of some things and a relative oversupply of others" (Chandler 1951, 6). As a graphic example, Hart (1951b, 4) writes, "[i]f we decide to prepare planes and fliers for a massive airlift across the Atlantic in the event of war in Europe, we had better be sure to provide for a corresponding gasoline supply." If production is unbalanced, then resources are being wasted because goods are being produced that cannot be used (Wallace 1951, 22). This requires careful foresight as balance is ultimately a dynamic process, and the program should be balanced at all times (see also Hart 1951b, 47-52). For instance, if the Green New Deal involves a nation-wide upgrade of the electrical power system, then the relative timing of worker retraining, generation station construction, and grid retrofitting will need to be plotted out such that each stage is begun at the proper time so that it is finished at the proper time, not too soon or too late. Or, for the pandemic, testing of a vaccine

should be done concurrently with ramping up our ability to mass produce and distribute vaccines, so that the delay between approval and widespread availability is minimized.

In a feasible program, "the total resources required to meet it should not exceed the expected supply of resources," and, "the distribution of resources among the several stages of production be such as to produce an internally consistent structure of production" (Fabricant 1952, 57). Obviously, whether a program or parts of a program are feasible is a strikingly difficult question. However, Fabricant offers us four heuristic tests. For each of the following tests, estimates of the current and future probable maximum capacity of the economy should be compared to the needs of the program: (1) the total amount of goods and services, (2) the total quantity of particularly important input materials, (3) the total amount of necessary labor, and (4) the total quantity of plant and equipment for certain sectors required (Fabricant 1952, 57). Each of these tests makes some unrealistic assumption, such as fungibility of factors of production between industries, and requires data that likely does not exist - but together they can be suggestive of the feasibility of the program (ibid.).

Of course, there is no need for the program to cover every detail of the economy (CEA 1951, 513; Fabricant 1952, 48). That is, the music is more like jazz than like a symphony — the program offers the structure of the mobilization, with the details to be worked out amongst the various musicians when the time comes. In particular, programming is likely to be more detailed in the sectors essential for mobilization, and less detailed in the consumer industries (Wallace 1951, 17). However, an important role for the program is to offer clear and concrete goals. In particular, specific quantitative targets can "have a galvanic and unifying effect throughout the economy," and "will replace the negative concept of sacrifice with the affirmative concept of service, by drawing all into an affirmative program directed toward positive results" (CEA 1951, 515). These goals should be set high, rather than low to "attain an easy bull's-eye," as ambitious goals will encourage people to work harder (Fabricant 1952, 52). But, of course, they should not be impossibly high, or else morale will suffer.

Finally, the perfect should not be the enemy of the good. Although programming depends on the mobilization strategy as decided by military or scientific experts, programming can and should begin even if that strategy is not yet complete (CEA 1951, 514). And as Fabricant reminds us, "[p]erfect programming is impossible. Confusion, disorganization, inconsistency, reorganization, a plethora of orders and paper work in Washington — these are inevitable in a period of defense and war as death on the battlefield. The problem is to minimize them" (Fabricant 1952, 73).

Mobilization Frameworks for Public Finance

While many pieces from the early post-war literature touch on specifics of a particular circumstance or control, several authors present "big picture" conceptions of mobilization, typically in the form of a plan of action for public finance. I refer to these public finance concepts as "mobilization frameworks," and I identify five primary examples: "pay-as-you-go," the Keynes Plan, "expenditure rationing," Ruml's voluntary saving program, and Galbraith's "disequilibrium system." A word of caution before diving in: these frameworks have varying degrees of detail, and overlap to some extent. I offer them here not primarily as fully-fleshed plans to be pulled off the shelf but as convenient devices for making sense of a mobilization economy, in particular how the "real" and "financial" elements fit together.

Whereas today "PAYGO" usually implies advocating a balanced budget in monetary terms, in mobilization theory, the "pay-as-you-go" framework directs the government to "use stepped-up conventional techniques of fiscal and monetary policy to close the inflationary gap" (Shaw/Tarshis 1951, 37). That is, the focus is on inflation, not on the deficit per se, and closing the inflationary gap likely does not correspond to a balanced budget. Proponents contend that without an inflationary gap, the price system could be relied upon to distribute goods adequately, as in peacetime, supposedly obviating the need for rationing and other direct controls (ibid.). A simple and flexible system, pay-as-you-go received broad support both in the early days of WWII and as a plan for Korea (Shaw/Tarshis 1951, 37; CEA 1951, 522; Backman 1951, 49).

Shaw and Tarshis (1951, 39) criticize pay-as-you-go for failing to apprehend the difficulties inherent in diverting production to military use, something we'll return to below, and argue that without specific controls, most civilian output would end up in the hands of the wealthy. But there was also a widespread fear that the taxes high enough to close the WWII inflationary gap would have created adverse incentive effects — that is, workers weren't going to work and firms weren't going to stay open if the majority of their wages and profits were promptly taxed away (Taft 1942, 64; Poole 1942, 93; Goode 1953, 89; Backman 1951, 41; Heflebower 1951, 551; Keynes 1940, 44, 57).

At full employment, additional goods and services cannot be offered as an incentive to labor because all available real resources must go towards the mobilization effort. However, money can be — so long as this income is saved rather than spent. In this way, the government is "in effect getting current work in return for a promise of future consumption or security" (Galbraith 1952, 37; see also Goode 1953, 90, Hart 1951, 14-15). Although this financial promise could take the form of blocked deposits or taxes rebated after the war, it most simply takes the form of Treasury securities. Indeed, Keynes (1940, 6) calls the national debt, "the right...to spend money after the

war," and by that definition each of these forms of saving would qualify.[4] Unlike pay-as-you-go, the remaining four frameworks each substitute saving in place of some amount of taxes. This saving is variously compulsory or voluntary.

Keynes laid out what came to be known as "The Keynes Plan" in his book *How To Pay For The War* in 1940. He stresses that "the civilian's cake is fixed" (Keynes 1940, 5-6), therefore, regardless of whether income beyond this is spent or saved, the same amount of consumption occurs. But if it is saved, then people will have money to spend after the war, rather than price increases during the war. The primary feature of the plan then was a deferred pay scheme, but it also included three other planks: a family allowance, indexation of "the iron ration," and a post-war capital levy (Keynes 1940, 10-11).

The deferred pay program was a progressive way of closing the inflationary gap. With an amount calculated by which each person's consumption would have to be reduced, under the plan, most of that amount would be taken as taxes for wealthy people, while for poor people, it would be taken primarily as deferred pay (p. 31, 36) with an exempt minimum income under which consumption would not be reduced. The deferred income could be held by an institution of the worker's choice, which would be given some leeway in determining emergency conditions under which the funds could be obtained early (p. 43-44). The money would be released after demobilization, preferably at the first sign of recession, in a series of installments. "If the deposits are released in these circumstances, the system will be self-liquidating both in terms of real resources and of finance" (p. 45-46). Real resources because it will call forth production instead of letting unemployed labor go to waste; finance because it will substitute for the need to "raise money" to tackle unemployment.

Additionally, the government would designate a basket of minimum subsistence goods, known as "the iron ration." The government would strive to keep the price level of this basket constant, and unions would be free to press for wage increases if the index rose (p. 33, 57); this is in exchange for unions agreeing to the deferred pay scheme and not agitating for wage increase in other circumstances (see also Harris 1951, 232-233). The post-war capital levy would be to reduce the level of the national debt, to ease the difficulty in meeting the postponed consumption demand.[5]

[4] Keynes also understood that the national debt represents private wealth. Noting that any additional worker effort goes to the war and not to additional consumption for the worker, he wrote, "[t]hose who make the effort have, therefore, only two alternatives between which to choose. They can forgo the equivalent consumption altogether; or they can *postpone* it." (emphasis in original); this increases private wealth, "[f]or that is what wealth is, - command of the right to postponed consumption" (Keynes 1940, 30).

[5] Kalecki (1943) also calls for a postwar "capital tax" as the ideal tax to ease any national debt burden, but whereas Kalecki's "capital tax" refers to a general tax on all forms of wealth, Keynes's is left somewhat ambiguous in the book.

As the Keynes Plan is a policy of compulsory saving, a number of general criticisms of forced saving apply to it. For one, as Keynes himself acknowledges, forced saving is likely to diminish how much people voluntarily choose to save (Keynes 1940, 59; Kalecki 1941, 2; Backman 1951, 60). Forced saving also lacks social and morale benefits that a program of voluntary savings could have (Ruml 1951). A more specific criticism of Keynes's method of forced saving, deferred pay, is that while it prevents consumers from spending out of income, it does not stop them from spending out of pre-existing wealth (Shaw/Tarshis 1951, 38-39; Holben 1942, 516).

This motivates our third mobilization framework, known as "expenditure rationing." This scheme is also known as "purchasing-power rationing" (Murphy 1950, 80; Hart 1951b, 89), or "general rationing," as contrasted with "specific rationing"; whereas specific rationing refers to rationing in a particular market for a certain good, general rationing attempts to limit expenditure in aggregate. (Holben 1942, 513). This plan, primarily associated with Kalecki (1941), is another form of forced saving, which places limits on an individual consumer's total retail spending to a certain proportion of their income up to some maximum amount of money.

Whereas a deferred compensation mechanism reduces income with the hopes of reducing spending, expenditure rationing proposes to limit consumer spending by regulation. Mechanically, this is done by creating what is essentially a parallel currency, which must be exchanged alongside money in all retail purchases and is then collected by the government from producers[6]. To preserve the incentive to labor, the distribution schedule of ration currency is designed to preserve a "regressive linkage between personal incomes and expenditure rations" (Shaw/Tarshis 1951, 43) – in other words, those with higher income get more rations.

The advantage of this scheme is that, unlike the Keynes Plan, consumers cannot draw on their savings or borrowings in order to spend more than their take-home income. It is also meant to have a smaller administrative burden than specific rationing, which requires bureaucracy specific to each market being controlled. And, unlike the disequilibrium system discussed below, expenditure rationing attempts to keep aggregate demand in line with aggregate supply at noninflationary prices, and so obviates the need for price controls in markets solely supplying civilian needs, though controls could still be necessary in markets that also serve the mobilization effort (Shaw/Tarshis 1951, 43-44). The idea then is to use the price system as much as possible, rather than substituting it with government command (Goode 1953, 89).

The Kalecki Plan receives heavy criticism from Holben (1942), who argues that while general rationing could equalize total supply and demand, it would create significant imbalances in individual markets, because the system would increase variation in demand (Holben 1942, 513-

[6] In Kalecki's original plan, the currency takes the form of coupons, while in the Shaw and Tarshis plan, paper cash is called in and transactions are made using exotic types of bank accounts which come with limits on expenditure in a period, with different limits for each person (Kalecki 1941, 3-4, Shaw/Tarshis 1951, 43).

517). He also argues that these imbalances could lead to inventory sitting on shelves that people lack the rations to buy, which would hurt morale (p. 518). While Holben (1942, 517-518) argues that general rationing might be incompatible with price control, Hart (1951b, 89) suggests that general rationing may not work *without* price control. Murphy (1950, 81) also notes that unlike other control schemes, purchasing-power rationing is an all-or-nothing plan which cannot be gradually phased in.

Unlike the previous two frameworks, which are both forms of compulsory saving, Beardsley Ruml favored a voluntary savings program. Ruml argues that the primary mode of inflation control should be a mass persuasion campaign to convince people to refrain from consumption (Ruml 1951). He argues that a voluntary savings program has a high degree of flexibility. It can be left up to individuals to decide how much saving suits their own needs, and the program can quickly be ramped up or down in real time merely with word of mouth.[7] Ruml also highlights social-cultural benefits, claiming that a saving campaign would require mass education that would be an aid to the mobilization in general (p.33). Ruml states that a savings program would bring in "all organized elements of the community, particularly the religious and educational agencies that have consistently over the years emphasized that the good way of life is not measured by bread alone." He claims that this "reorientation of values," presumably away from current consumption and toward future preparation, would aid in defense — certainly it would assist in a Green New Deal.

A related issue is the liquidity of the instruments people hold as savings. Some writers insist that an effective anti-inflation monetary policy should reduce the liquidity of people's savings, to prevent them from being able to liquidate in order to purchase goods and services (Hart 1951, 58; Shaw/Tarshis 1951, 44-45). But Ruml argues the opposite, emphasizing that in order to be truly voluntary, the savings must be liquid. "It is obvious that no person is truly free unless he can get something of what he wants when he wants it, without having to ask for a loan and without being forced to dispose of an asset before he is ready to part with it" (Ruml 1951, 33).

The primary objection to the voluntary approach is that it simply wouldn't be enough to wage a large-scale war (e.g. Clark 1942, 27; Shaw/Tarshis 1951). Although Keynes supports voluntary saving in general he declares it "improbable" that a voluntary program alone would be sufficient: "Those who allege otherwise are deceiving themselves or are victims of their own propaganda" (Keynes 1940, 9-10). For Keynes, a compulsory saving plan is easier on people psychologically. "I also reckon it a merit of a prescribed plan that it reduces for the average man the necessity for a continuing perplexity how much to economise and for thinking about such things more than is good" (ibid.). However, it is worth noting that the voluntary approach is much closer to what the US actually did during WWII (see Olney 1971; Murphy 1950; Levey 2019).

[7] Ruml says it would take "six weeks at the most" notice to step up or down pressure to save (1951, 33). Surely with modern electronic communication that duration would be much reduced.

And finally, we turn to John Kenneth Galbraith's "disequilibrium system," as described in his 1952 work: *A Theory of Price Control* (Galbraith 1952)[8]. However, with the development of general equilibrium theory in the 1950's, the term "disequilibrium" carries much more historical and intellectual baggage today than it did in Galbraith's time. Therefore, I propose to replace the "equilibrium' and "disequilibrium" phrasing, and I offer the terms "loose mobilization" and "tight mobilization" instead.

Galbraith says that tight mobilization is characterized by "(1) a more or less comprehensive system of direct control over the employment of economic resources, (2) a nearly universal control over prices, and (3) an aggregate of money demand substantially in excess of the available supply of goods and services" (Galbraith 1952, 29) In short, tight mobilization "generates an inflationary gap; negates its inflationary effect on prices by imposing ceilings; and overcomes the distorting effect of frozen prices on real phenomena by direct controls" (Shaw/Tarshis 1951, 34). As direct controls are used to stop inflation even in the face of substantial excess demand for goods and services, this is also sometimes called "repressed inflation" (e.g. Hart 1951, 55).

By these definitions, pay-as-you-go is undeniably a loose mobilization scheme, as is expenditure rationing — both of these systems attempt to eliminate excess demand, the former using increased taxation while the latter uses compulsory saving. Ruml's voluntary saving strategy is compatible with either loose or tight mobilization, and arguably the US WWII mobilization was a voluntary saving, tight mobilization economy[9]. The Keynes Plan of deferred pay has ambition to be a loose mobilization plan, with the intention that between increased taxation and deferred pay, the inflationary gap is closed. However, surmising that if these steps proved insufficient then the government would freeze prices, we can view Keynes plan as compatible with tight mobilization as well.

Tight mobilization's use of price controls to stop inflation stands in sharp contrast to the generally accepted wisdom prior to WWII that price controls could not be used to arrest spiraling prices and therefore monetary and fiscal measures must be taken to eliminate excess demand (e.g. Stoltz 1942, 165,167; Clark 1942, 19-20; Keynes 1940, 34; and even Galbraith 1943, 258-259). Galbraith instead argues that through imposing a "positive pressure" to use all resources, the excess demand of tight mobilization is able to "dispense with the buffer of unemployed resources" that would otherwise be necessary for price stability (Galbraith 1952, 45).

[8] Many of these ideas previously appeared in a 1947 paper (Galbraith 1947).

[9]That being stated, as noted below, the price controls and rationing inherent in tight mobilization do themselves create a degree of involuntary saving.

Galbraith lists two primary benefits to this. The first is:

> to provide a taker for anyone who offered his or her services. Frictional unemployment was eliminated, in effect, by providing a market adjacent to every worker. Excess demand, in other words, established and sustained a nearly universal labor shortage. No one who wanted to work could complain of his or her inability to find a job, and no one who did not want to work could plead inability to find employment as an excuse (Galbraith 1952, 32).

The second is to allow incomes to be higher than they otherwise would have been if taxes or compulsory saving had been used to bring excess demand in line, which allowed for greater incentives to bring people into the labor force, increasing output (Galbraith 1952, 33-34). In effect, this is the converse of the problem of the disincentive to produce created by high taxation under pay-as-you-go: by forgoing hopes of closing the inflationary gap, the government is able to offer more incentive for the marginal worker or firm to enter the market. Although this is able to squeeze more output of the economy (described in more detail below), ultimately customers are shopping for products that don't exist. As Galbraith puts it, "[t]he counterpart of the current excess of aggregate demand is, of course, an equivalent volume of current saving" (1952, 35); mechanically, this is actualized through price controls and rationing, which create a form of involuntary saving since people are forbidden from bidding for goods beyond what the controls allow (Galbraith 1952, 36; also Murphy 1950, 78-79).

However, the inflationary gap cannot be of unlimited size or duration. Galbraith defines the term "margin of tolerance" as "[t]he volume of demand in excess of current supply that adds to, or is consistent with, additions to aggregate output" (1952, 35). Although Galbraith frames the discussion around the marginal utility of money compared to the marginal disutility of working, the concept might be more simply expressed in terms of savings desires: in a tight mobilization, workers and capitalists are accumulating financial claims on the government; essentially, the margin of tolerance ends when people have saved so much money that they don't want to work anymore. At this point, the offer of future consumption for current labor fails, and total output decreases as some workers and firms cut hours or exit the market.

It is the job then of the mobilization authorities to keep the economy within this margin of tolerance. This margin is in many ways influenced by expectations. For instance, if savers expect inflation to wipe out their savings before long, then incentive to earn excess income now is diminished. Galbraith cites the German memories of hyperinflation as leading to a small margin of tolerance in that country during WWII, and suggests that the US post-war inflation of 1946-47 likely shrunk the margin for a possible 1950's mobilization (Galbraith 1952, 36-40, also Shaw/Tarshis 1951, 35; Hart 1951b, 160). He also suggests that the margin of tolerance will be small if the mobilization has no end date in sight, as people begin to believe that the money-claims

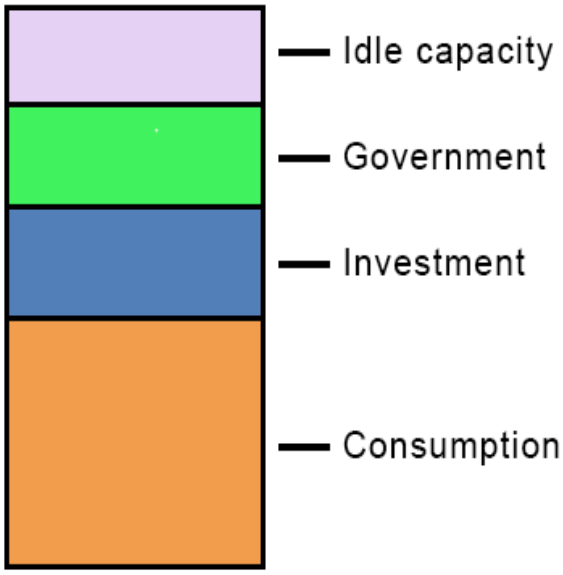
they are accumulating will never be redeemed for goods and so will decline to work for more of them (Galbraith 1952, 68-69, also Shaw/Tarshis 1951, 37; Hart 1951b, 160).

Criticism of tight mobilization chiefly is that it replaces market allocation with government rationing of available goods and services. Shaw and Tarshis argue that price controls and rationing are inefficient compared to the price system, and that tight mobilization requires an "alarmingly" large administrative organization to manage this allocation, and in particular, pits stabilization agencies against mobilization agencies, "though logic suggests they should be natural allies," leading to increased turnover of these administrators (Shaw/Tarshis 1951, 35-37, 50). Even if the controls can stop price inflation, there could still be quality deterioration (ibid.)

Costs of Allocation and Degree of Mobilization

I propose that we can understand the difference between loose and tight mobilization through what I term "costs of allocation." The entire potential output in peacetime is usually thought of as in **Figure 1,** which shows a certain amount of production performed in service of consumption, investment, and government. In peacetime there is nearly always some idle capacity left over, resulting in some unemployment and capacity underutilization.

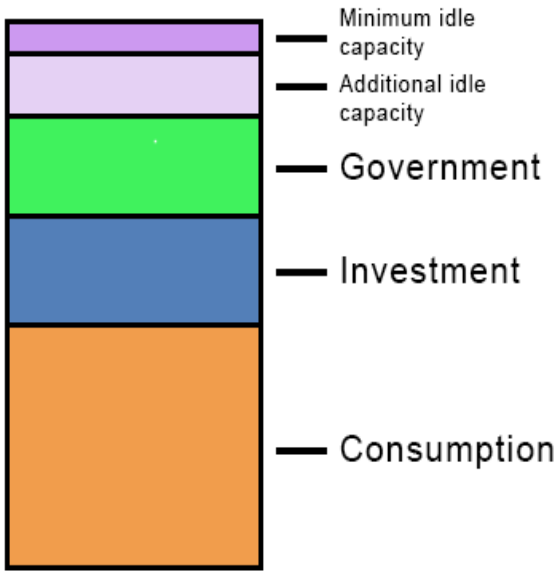
Figure 1: Standard conception of economic resources (closed economy).



It has long been theorized that a buffer of unused resources is necessary for price stability in capitalism in order to keep the bargaining power of workers in check, and thereby prevent accelerating wage demands (e.g. Marx 1992 [1867] ch.25). I further suggest that part of this pool of unused resources can be understood as the resource cost necessary to allocate goods using the price/market system in a stable manner.

It is patently obvious that if the government replaces the price system with price controls and rationing, that this entails an appreciable resource cost, specifically the administration and infrastructure needed to operate the system. It is sometimes recognized that the market system has operating costs, e.g. Coase's "costs of using the price system" (Coase 1937). But whereas Coase infers microeconomic effects of this cost (i.e. the existence of firms rather than market-based production), it is not typically included in macroeconomic models. Models assume that the market system operates either at no cost, or perhaps that firms have idiosyncratic "menu costs" associated with changing prices. But there's no reason to believe that the allocation machinery itself shouldn't have a social cost, which takes the form of a minimum buffer of idle capacity (see **Figure 2**). Of the causes or sources of this cost, mentioned above already is the need to discipline wages to keep costs down; this view could also be mapped onto other production inputs, where spare capacity prevents the marginal seller from having pricing power.

Figure 2: Minimum slack buffer necessary for market functioning (closed economy).



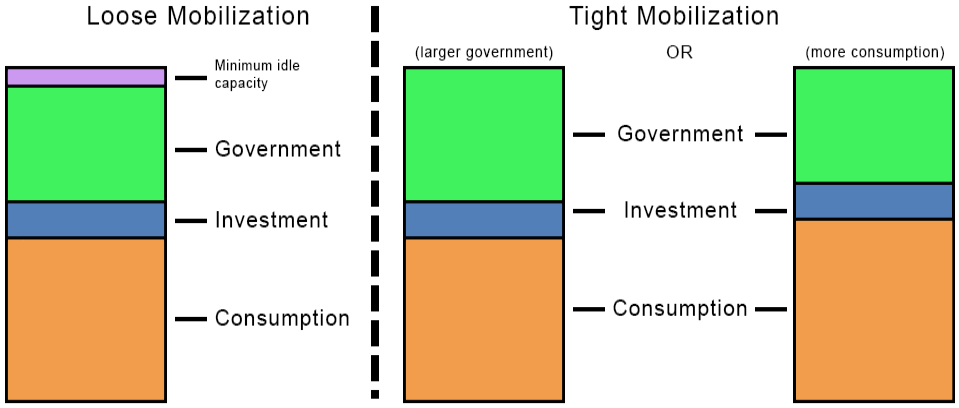
Also important is the need for excess capacity in the form of inventories and idle production machines in order to respond to short-term variability in demand without jeopardizing profits. Lavoie (2014,150-154) surveys evidence and theoretical explanations of planned excess capacity, highlighting especially the need for flexibility to respond to varying consumer demands in the face of fundamental uncertainty. For our purposes, I think this is helpfully framed in terms of choice[10]. Any system that allows for on-the-spot preferences when allocating goods requires excess capacity. Providers of goods must be prepared both for the possibility that a consumer will not ask for a certain good, and the possibility that they will. [11]

[10] To quote Keanu Reeves from The Matrix (though in a somewhat different context), "the problem is choice."

[11] I recently had chance to reflect upon this while on an airplane. If the flight crew could know in advance exactly which and how many snacks the passengers would want, they could bring exactly that amount. But in the absence of that knowledge, the crew packs the plane in such a way as to be prepared for the range of likely choices that the

Loose mobilization schemes attempt to preserve this idle capacity, whereas tight mobilization jettisons it, implementing instead allocation by direct government order (see **Figure 3**). Allocation by decree has the characteristic of requiring fewer resources than the market, but also being less responsive to consumer preferences or changes in circumstances. The difference between costs of allocation for the market and for the government makeup a sort of capacity reserve, from which either increased civilian or mobilization resource usage can be drawn if the population is willing to forgo the freedoms and responsiveness that 'market rationing' normally provides and instead live with government rationing. If this reserve goes untapped, as loose mobilization plans attempt, then, given the same scale of mobilization, the private sector must face higher taxes or save more.

Figure 3: Loose mobilization vs. tight mobilization: eliminating the minimum slack (closed econom).



In that regard, tight mobilization is an attempt to squeeze every drop out of the economy, whereas loose mobilization tolerates some underutilization in favor of preserving the market system. For households, the tradeoff is that in a tight mobilization they can consume more (have lower taxes and/or less additional money-saving) but must bear more rationing and other direct controls compared to loose mobilization. During WWII, the United States chose the former. But for a mobilization expected to be much longer, like a 10-year Green New Deal, voters may prefer slightly lower consumption in order to "pay for" less rationing and direct control in their daily lives. For this reason, I expect a Green New Deal to be a loose mobilization, at least for the plurality of the time, although perhaps drifting periodically into tight mobilization at particularly opportune moments if the political will can be found.

The COVID-19 pandemic does not quite fit into the framework as elaborated above, because it has a more elastic resource constraint. This is because, unlike WWII in which the labor supply was relatively fixed once unused reserves were tapped, during a quarantine society faces a tradeoff: we could increase the labor supply by directing more workers to return to work, but at the price of

passengers could make. If the goal of the flight crew is to avoid being embarrassed by running out of a snack before each order on the plane has been taken, then they must bring an excess, and, in the mean, they will still have an excess after all orders have been filled, on the majority of flights. This excess capacity could be eliminated by replacing on-the-spot passenger choice with an alternate mechanism — perhaps command by government, but equally workable would be to take orders prior to takeoff. This excess capacity can be thought of as the 'cost' of allowing passengers to choose after takeoff.

speeding the spread of the virus. Superficially this is not so different from balancing the size of the labor force against the size of the military, although it has the advantage that it can be done much more quickly. Regardless, although the overall labor supply will be declining quickly for some time, we will likely simply note let it fall at the most essential production lines. While prolonged and strict quarantines could force us into a tight mobilization situation, we could exit it not merely by closing the inflationary gap through demand management but also by releasing workers from their homes to increase output. As of this writing however, broad-scale mobilization of idle resources towards fighting the virus does not appear to be forthcoming, and so perhaps we will never even approach an inflationary gap.

Controls

While some WWII-era economists favored use of the price system in wartime more than others, it was broadly understood that the market mechanism on its own could not meet the needs of mobilization. The price system is not fast enough to re-allocate resources for urgent mobilization purposes, especially as producers will be reluctant to invest in plant and equipment to meet mobilization demand that they see as temporary. In mobilization, the government needs the majority, or even totality, of the output from certain markets, and purchases on a price-insensitive basis — the price system is simply not suited to handle a buyer of this sort. Competition with private buyers in these markets would push up costs (exacerbating inflation even before full employment), while allocating any leftover supply to those with the deepest pockets or strongest unions, rather than the greatest need. Protecting civilian morale requires more equitably allocating consumer output and preventing profiteering. For production efficiency, we may want to limit market competition and create market concentration or monopolies. (For more on the above points, see: Neal 1942, 11-14; Beatty 1942, 43; Shaw/Tarshis 1951, 39, 46; Heflebower 1951, 552; Galbraith 1952, 30-31; Stoltz 1942, 169; Backman 1951, 10, 13, 57-58; Harris 1951, 234; Chandler 1951, 11-13; Wallace 1951, 17). And, of course, increasing government purchases for mobilization when the economy has little spare capacity will be inflationary. For these reasons, controls of various kinds are necessary.

Controls can broadly be divided into two sorts: general ("indirect") and specific ("direct"). General controls refer to broad measures that are felt economy-wide and meant for macro stabilization, such as taxation or interest rate policy, while specific controls refer to interventions in particular markets, firms, or production processes. Although volumes could be written on the selection, design, and implementation of each type of control, here I limit the discussion to a brief outline of different types, and how they are relevant to mobilization.

General Controls

The most familiar example of general controls is fiscal policy. The civilian conception of public finance in peacetime is that the task of the government is to "find the money" to pay for social services and transfer spending. Although Modern Monetary Theory (MMT) is challenging that view today, during past wars it was unequivocally rejected. For instance, Thomas writes that in war, finance should:

> be the servant, not the master. It is essential that needed funds always be readily available… With modern central bank techniques, governments can readily obtain funds in almost any amounts. The more important consideration of war finance is to raise funds in a manner which will minimize inflationary consequences not only during the war but in the years to follow (Thomas 1951, 621).

Spending the requisite amounts and then taking measures to prevent inflation and other problems caused by this is the general pattern of mobilization finance. (See the appendix for further quotations to this extent.) This spending exacerbates inflationary pressure both because of the direct purchases by government, but also because these create private income that is not matched by any increase in goods available for private consumption (Taft 1942, 70; Clark 1942, 2-3; Keynes 1940, 8-9, 17; Backman 1951, vii, 11; Harris 1951, 230; OPA 1943, 1-2; Hart 1951b, 36-37, 59-60; Murphy 1950, 64; Chandler 1951, 15; Wallace 1951, 34).

While cutting nonessential government spending and pursuing efficiencies in mobilization spending are important goals, it is primarily the revenue-raising side of the budget that can be employed as a general control. A key question is when to run deficits and when to increase taxes. Although ultimately the choice of mobilization framework as described previously will determine the criteria to use, we can provide some general remarks.

Taxes were widely recognized as having an anti-inflationary effect through reducing aggregate demand. "Because taxation offsets the increased demand of government expenditures, it is the basic measure for attacking inflation" (CEA 1951, 521-522). "The Treasury, the Congress and the general public are of course familiar with the idea that taxes are anti-inflation weapons — an obvious lesson of the world's long list of experiences with inflationary war finance" (Hart 1942, 87). (For other mentions of taxation as a tool against inflation, see: Hart 1951b, 37; Backman 1951, 16-7; Thomas 1951, 625; Poole 1942, 92-3; Galbraith 1951, 547; Even Milton Friedman: Friedman 1942, 318). Although the politics of raising taxes are often tricky, during mobilization it can be easier, because a) there is a greater patriotic willingness to sacrifice, b) increased income means increased ability to pay taxes, and c) diversion of resources to mobilization means there are not goods/services available to be purchased with the money anyway (Poole 1942, 94, Backman 1951,

40-41; Levey 2019).[12] (While this is likely to be true for a Green New Deal, it will emphatically not be the case during the pandemic response, if quarantines keep incomes down. If quarantine-induced shortages do arise, the line of attack will inevitably need to be getting production back up, rather than keeping demand down).

What's more, not all taxes are created equal. In order to be effective, an anti-inflation tax must reduce consumer spending (CEA 1951, 524; Heflebower 1951, 551-552), yet different taxes have different effects on consumption, saving, and investment (Poole 1942, 96; Backman 1951, 50; Heflebower 1951, 551-552). The distribution of taxes is also a tricky issue: if the tax burden is perceived as unfair, then the public will not support the mobilization effort (CEA 1951, 525; Taft 1942, 64; Murphy 1950, 62). This fact calls especially for raising taxes on the wealthy and those most able to pay, in order to keep morale up among the general population; however, raising taxes on the wealthy does little to combat consumer spending or inflation, as there are fewer wealthy people and they are least likely to cut their consumption in response to tax increases (Clark 1942, 26; Kalecki 1941, 2; Keynes 1940, 20-28; Backman 1951, 50; Murphy, 69).

The effect of the deficit is more contingent. If the government increases its spending without correspondingly decreasing somebody else's, then this is undoubtedly expansionary (Poole 1942, 91-92; Clark 1942, 2; CEA 1951, 522). However, the government can take action alongside its spending to reduce private spending, leading to a common distinction between "expansionary" vs "non-expansionary" deficits (e.g. Backman 1951, 37,42,44; Hart/Allen 1941, 74; Hart 1951b, 140). As Poole (1942, 95) points out, in peacetime bond sales, "since no purchasing power is taken from *consumers*, only from *savers*, this kind of borrowing has no immediate effect in reducing any tendencies to price rises." But deficits can be made "non-expansionary" if "the funds lent to the government are funds which would otherwise have been spent" (Hart/Allen 1941, 74). This can happen during mobilization as "sale of government securities takes on a more urgent character, and appeals are made to individuals to replace consumption with saving" (Poole 1942, 95).

A key point is that the focus of deficit policy should not necessarily be to funnel more people into government bonds, but rather to get them to save in general, in any form (Murphy 1950, 72). As Ruml points out:

[12] A related point is that it is not actually the taxes which force people to sacrifice — it is the government's spending, which redirects real resources from private use to public use. The taxes merely serve to reduce demand elsewhere to prevent inflation (Clark 1942, 26; CEA 1951, 522-523; Backman 1951, 62). An alternative way to think about it is that an increase in government spending (at full employment) creates a private burden, while taxes *distribute* that burden, they determine who must consume less so that more resources can be devoted to mobilization (although taxes are not the only mechanism that can effect a reduction in consumption).

> A national savings program is something more than a program to sell or to refund a certain quantity of government savings bonds, we must keep in mind that we want an actual reduction of demand for goods, whether the money saved goes into government bonds, or into savings banks, or even under mattresses. From the point of view of fiscal policy, the *manner* of saving is far less important than the *fact* of saving (Ruml 1951, 33).

That is, if the money buying a government bond was money that would have been saved anyway, then it is of no aid to the mobilization because it does nothing to check consumption or the tendency to inflation (Clark 1942, 27). Rather, to be anti-inflationary, an increase in the deficit must be accompanied by an *increase* in desired saving (CEA 1951, 522; Murphy 1950, 72)[13]. One exception is if the liquidity of people's savings is low, such that somebody who has decided to save in the past cannot easily decide to dis-save in the present, as might be the case for a non-marketable bond that cannot be redeemed until maturity. In this case, selling government bonds today may decrease inflationary pressure in the future compared to saving in cash (Hart/Allen 1941, 84-85; Hart 1951b, 136; Thomas 1951, 630). As Hart sums up, "[t]he anti-inflationary effect of debt policy depends, of course, on the way securities are sold as well as on the types offered" (Hart 1951b, 140). The implication here is that a Green New Deal could be "paid for" (i.e. fiscal space could be created) in part by running a mass persuasion campaign to persuade people into saving and by offering financial instruments which make this convenient.

Interest rates are another type of general control, but the literature of this era finds less of a clear consensus on what to do with them (Goode 1953, 91). A contractionary effect on demand of raising interest rates might be cancelled out by the stimulus this creates of increased government interest payments (Backman 1951, 67-68; Hart 1951b, 145), and, with direct controls holding down private investment anyway, the contractionary effect is likely to be small[14].

Bosland (1942, 114), citing Pigou, argues that interest rates should be kept low during wars for moral reasons: "the interest rate must be restricted unless the government is prepared to risk the odium resulting from rewarding liberally those who furnish their money, while asking others to risk their lives." This no doubt applies to the coronavirus outbreak as well. Still another consideration is the effect on interest rate changes on government bond prices, as "rising interest rates would cause falling government bond prices — a condition which might reflect on national strength, lead to expectations of further declines, demoralize public subscription to new issues,

[13]Though there is something of a thorny issue of definitions here. As Keynes (1940, 61-68) explains, absent compulsory saving, any government deficit "necessarily remains in the hands of the public in the shape of voluntary savings. That is an arithmetical certainty." If consumers don't want to save in current conditions, then prices will rise, altering the distribution of payments (and the deficit) until the income comes to rest with somebody who wants to save it. This is related to what Hart calls inflation "braking forces" (Hart 1951b, 71-77), and to Murphy's "paradox of saving" (Murphy 1950, 75).

[14] Treasury Secretary Henry Morgenthau likened interest rates increases in mobilization to "raising a lever which has no machinery behind it" (Morgenthau 1945, 413-414).

and cause losses (on paper, at least) to those who were patriotic enough to subscribe to earlier issues" (ibid.. See also Levey 2019).

A general price freeze could be included as a general control, as per Backman (1951, 16-17), but I will describe price controls more generally in the discussion of specific controls, to which we now turn.

Specific Controls

Turner (1950, 3) defines direct controls as "legal devices for directing, guiding, or restraining some aspect of economic behavior in which the control device applies directly to the economic process or factor which it is desired to control, in contrast to an indirect control which relies upon action through an intermediary factor." The Council of Economic Advisers wrote that specific controls can do three things: "First, controls can promote production by channeling resources into the most desirable uses; second, controls can promote economic stability by restraining excessive demand; and third, controls can promote equity in the distribution of goods and services" (CEA 1951, 519). Specific controls tend to be faster, more effective, and more flexible than general controls (Turner 1950, 22-23), but also rely on significant public support and compliance (Turner 1950, 9, 21; Hart 1951b, 85) and tend to "wear out" over time as people learn to evade them (Hart 1951b, 96). Furthermore, they are obviously more intrusive into everyday life, and come with substantial administrative costs, as implementing them requires knowledge of specific markets and current conditions (Backman 1951, 21, Galbraith 1946, 488-489; Galbraith 1952, 26-27), and setting up controls in some markets tends to create a need to control more markets (Turner 1950, 9; Backman 1951, 18-19; Holben 1942, 513).[15] This is especially true of price controls and rationing, which generally come as a pair (Backman 1951, 18; Turner 1950, 15; Stoltz 1942, 186, 193-194; Galbraith 1952, 11-12; Holben 1942, 513; Hart 1951b, 89).

An additional measure that can be used to reduce demand is direct credit controls.[16] These are regulations which stipulate terms for certain kinds of loans, often mandating larger down payments or shorter repayment periods (Backman 1951, 79-80, 82; Hart 1951b, 127, 129). The former makes credit more difficult to quality for, reducing purchases, while the latter increases the size of the monthly payment for a given size debt, which temporarily reduces consumer income available for other spending (Hart 1951b, 127). Credit controls have the distinct advantage compared to general controls like interest rates in that they can be easily targeted to specific markets, such as auto loans (Backman 1951, 80). They can also be more targeted geographically. Conversely, they can be evaded by borrowing under different labels, e.g. drawing on a line of credit instead of taking out an auto loan (Hart 1951b, 131). Credit controls can also shift the market in favor of cash buyers

[15] Turner reports that a common refrain at the War Production Board during WWII had been "priorities breed priorities," referring to priority orders, a kind of direct control discussed below (Turner 1950, 9).
[16] Hart comments that "[q]ualitative credit controls - measures to limit or reduce lending of specified kinds - are the most obvious line of monetary control" (Hart 1951b, 125).

for a product, which is probably regressive (Hart 1951b, 127; Backman 1951, 81). An alternative form of credit control would be simply to place maximum loan quotas on individual banks (Hart 1951b, 131). Credit controls of some sort are likely to prove valuable in a Green New Deal, both for creating additional fiscal space for infrastructure spending, as well as directing credit out of speculative purposes and towards financing needed private investment in physical capital. What we might call credit controls of another sort, directing what loan money can be used for, will be critical to the success of corporate bailouts in the current pandemic: if stipulations on uses are not placed on bailout cash given to corporations with limited liability, then we will find that the bailouts have merely become a pass-through for inequality-increasing giveaways to shareholders and corporate management.

Perhaps the most important controls are those which ensure that resources needed for mobilization are in fact directed to those ends. The simplest method of accomplishing this is a system of "preference ratings," or "priorities" (Wallace 1951, 28). A priorities system "involves ranking the various orders for goods and services in order of urgency, and giving priority to those at the head of the list." (Fabricant 1952, 66) Private producers are then required to fulfill contracts not in the order they're received, but according to the priority ranking attached to each (Beatty 1942, 44-45, 51-55). A priorities system is simple in principle and can be implemented quickly making it very valuable for the early stages of any mobilization (Fabricant 1952, 66, 69), however it has some serious drawbacks. While priorities can aid in reducing production of unnecessary luxury goods, e.g. by failing to prioritize raw materials for those uses (Backman 1951, 20), this can create a condition known as "priorities unemployment," in which the workers who had been producing those goods are left without work (Taft 1942, 84; Beatty 1942, 48).[17] Additionally, the priorities system will tend to break down as shortages occur, falling victim to what is essentially a form of inflation, as orders are issued with successively higher and higher priority in order to ensure production, until eventually all government orders are issued with top priority (Fabricant 1952, 69; Beatty 1942, 55; Wallace 1951, 28).

If the priorities system breaks down, the next logical step is an "allocations system." Issuing allocation orders "involves calculating a feasible program, and then allotting to each section of the program, whether military or civilian, a specific and appropriate portion of the expected available supply of the particular materials or other scarce resources to be allocated" (Fabricant 1952, 66). An allocation system obviously takes more training and organization than priorities, so Fabricant suggests beginning mobilization with a priorities system while simultaneously collecting data and training personnel to run an allocations system should the need arise (Fabricant 1952, 69). I suspect that this will prove to be useful advice for a Green New Deal: with all luck, a simple priority system will prove sufficient for ensuring that most resource needs are met, but we should prepare

[17] This creates both unemployment and a price increase of the particular commodity, necessitating either price controls or excess profits taxes (Backman 1951, 20), as well as ensuring that high demand in other markets is able to absorb these workers.

machinery for an allocation system, to be ready should conditions require it. For the pandemic, priority orders may become necessary for the production of particular badly-needed medical goods; however, private entities in other lines of business may be reluctant to shift over production to these goods since the demand will obviously be temporary. To induce them to do so may require allocation orders, or else they should be made through outright government production.

As noted above, a tight mobilization by definition will have widespread price controls, to "repress" inflation. But even in loose mobilization, price controls can have important uses. It was of course commonplace during this era to write about "demand pull" vs "cost push" price increases (e.g. Hart 1951b, 59; Galbraith 1951, 546-547; Clark 1942, 3); whereas by definition in a loose mobilization the inflationary demand gap has been closed by monetary and fiscal policy, price controls could still be necessary to fight cost push factors. For instance, Galbraith argues that without controls, any slight inflationary pressure at full employment will be magnified into a wage-price spiral (Galbraith 1952, 63-65). Prices of raw materials that are being diverted to mobilization could also rise without sufficient controls, leading to a general cost push and potentially profiteering (Hart 1951b, 66; Stoltz 1942, 166-167, 170-171). And, fear of future price increases may lead to speculative hoarding now (Stoltz 1942, 167, 171; Neal 1942, 11-14; Goode 1953, 91; Clark 1942, 17-18; Backman 1951, 12, 22; Hart 1951b, 70, 84-85; Chandler 1951, 15; Wallace 1951, 17, 35), which can be prevented with price controls.

As Hart puts it, "[t]he sensible way to look at rationing is as a partner of price control." (Hart 1951b, 89). The function of rationing in mobilization is to distribute limited consumer supplies of necessary goods in a manner more equitable than the price system would, essentially to prevent the wealthy from buying an unfair share of scarce output, as well as to aid price control enforcement by reducing demand pressure (Hart 1951b, 89; Stoltz 1942, 193-194; Manning 1960, 24; Keynes 1940, 53; Backman 1951, 135).

Hart hints at a somewhat sociological view where the function of rationing is for the state to sanction certain claims on limited output, to prevent people from pressing their claims by bidding:

> Strong claims to supplies, if reasonably represented in the basis for handing out ration coupons, are protected. Disappointed buyers who know that their claims have been fairly considered in the issue of coupons do not feel so free to press their claims upon sellers; sellers find it easier (if only because a definite standard is set up) to refuse them, instead of negotiating a private deal (Hart 1951b, 89).

Discussing the case of the authorities issuing too many ration coupons, which can cause the system to break down as demand exceeds supply, Hart notes that:

> Many claims that claimants feel are strong, and that the authorities have endorsed by issuing coupons, are unfilled. These claimants may then feel morally justified in going onto the black market for the goods they lack (Hart 1951b, 91).

Essentially, the state functions to provide legitimacy to certain claims and not others, as the needs and preferences of individuals are weighed against the needs of mobilization. This view represents a less hydraulic and more social understanding of the functioning of these controls, which may be worth developing further.

While hypothetically rationing can work by itself, it was discovered that in practice it generally must be paired with price control (Backman 1951, 36, Hart 1951b, 88-89). This is because of the inability of administrators to perfectly forecast both actual production as well as what percentage of the ration coupons will actually be used. This means it is virtually guaranteed that they will not align perfectly, and the market will be in slight shortage or slight surplus. In administered price markets this isn't so bad, but in competitive flex-price markets, this will quickly send the price spiraling upward or downward if it is not controlled (Hart 1951b, 88-89).

Would a Green New Deal have price controls and rationing? If so, how much? It goes without saying that rationing places hardships on consumers. Keynes compares rationing to Bolshevism, writing "[t]he abolition of consumer's choice in favour of universal rationing is a typical product of that onslaught, sometimes called bolshevism, on differences between one man and another by which existence is enriched" (Keynes 1940, 53). There are of course administrative burdens as well. In the context of total war however, arguably, these burdens are created by the war imperative, not the rationing program itself. A Green New Deal on the other hand, offers some flexibility: if the goal is to transform the economy, our choice of the speed of that transformation will determine the extent of the need for resource diversion. Another important difference is in the nature of war output. A war economy specializes in weapons, tanks, and other fighting materials which are likely to be destroyed in battle, or useless after the war if not. But most of the "mobilization output" from the GND is likely to be in investments that make the private sector more productive, such as alternative energy, public transportation, education and training, etc. With proper programming then, we may be able to entirely avoid shortages of consumer necessaries, obviating the need for most rationing. We may still face shortages in luxury goods and perhaps certain durables, as raw materials are temporarily diverted to larger infrastructure investments at various points in the process. These may be better dealt with not by rationing, but with large excise and/or excess profits taxes: the prices consumers face for luxuries are allowed to rise to choke off elastic demand, at the same time as income from these profits is diverted to the government, to reduce war profiteering and prevent demand-pull inflation in other markets if these incomes were spent (Backman 1951, 19-20; Hart 1951b, 105).

What about for the COVID-19 outbreak? Before speculating on the answer, let me give a few general remarks on the nature of the potential inflationary problem in a pandemic. The essential fact is that quarantines of workers has and will reduce real GDP significantly. These represent goods that nobody can consume, because they were never produced — that's a real loss. On the financial side, this lack of production and lack of demand are causing tremendous financial losses. While these losses can't be avoided in aggregate, they can be pushed onto other economic units — when firms try to fire workers, or tenants call for a moratorium on rent payments, they are attempting to do just that. With there being no obvious party who "should" take the loss for a pandemic, in all likelihood most or all of the financial loss will eventually get pushed onto the one entity that can withstand them — the federal government. However, the real loss must be borne by somebody. To some extent that is happening through a reduction in aggregate demand, as people who reduce their expenditures are in effect "self-selecting" to bear the real loss. But if not enough entities "self-select" — that is, if the drop in demand ends up being smaller than the drop in production — then this will set up an inflationary dynamic as buyers in the market compete for a limited amount of real product, potentially driving up prices. Should this inflationary scenario happen, society will be facing two choices: distribute our inadequate real resources in a chaotic fashion to the highest bidder; or distribute our inadequate real resources in an orderly and equitable fashion through rationing and price controls. Government can also reduce excess demand by imposing financial losses on entities through taxation or bailout terms, or the various other measures discussed in this piece. Put simply: we must make a collective decision about who should bear the real losses.[18]

It's worth noting that at the present moment, economists seem optimistic that the demand gap will be greater than the supply shortages, and so a general shortage-induced inflation won't be a worry. Of course, this could change at any moment, but we can hope for the best. However, even absent aggregate shortages, there are already, and will still be more, shortages in critical medical goods. For this the government has *already* taken some anti-price-gouging steps, but likely stronger price control will be needed. This is particularly the case as, as yet, the federal government has preferred the individual US states to procure their own supplies, effectively pitting them against each other in the market for critical goods. We have also seen some shortages and price gouging of consumer goods, as worried shoppers rushed grocery stores to stock up on essential items. If supply chains stay operative, likely this will stop on its own. As Galbraith (1943, 255) points out, in more personal and less competitive markets, firms will self-ration, to maintain customer relationships. This should be sufficient to prevent chaos during a temporary bout of panic buying; but should production drop for a longer period as a result of quarantines, then price controls and rationing will be necessary to distribute these goods in a more equitable manner.

[18] I will side-step further discussion here, but for my general opinions about who ought to bear the losses, see Levey (2020).

Returning to the topic of controls, for completeness, here are a few other kinds of controls that can be of use in mobilization: "limitation orders," which limit the allowable amount of production for a certain good; "prohibition" or "conservation" orders, which prohibit entirely the use of certain materials or production of certain goods; "simplification" or "standardization" orders, which prohibit "frills" or other quality variations, encouraging "utility models" of a good, i.e. simplified versions that get the job done; "inventory controls," which limit how much of a particular good or material a firm may stockpile, to combat hoarding; "distribution orders," which require a supplier to maintain a pattern of distributions to certain customers or geographical areas; rent controls; subsidies; and tariffs and other controls over exports or imports (Fabricant 1952, 67-68; Harris 1951, 235-236; Hart 1951b, 93; Turner 1950, 7).

Though I am hesitant to speculate on the extent to which a GND might make use of the above controls, some general discussion is in order. A Green New Deal is a long-term, limited mobilization. While, as in total war, some view climate change as an urgent existential threat, others are not likely to see it that way, and this means that the patriotic drive to cooperation and sacrifice, though we hope it materializes to some extent, cannot be expected to be as forthcoming as in WWII. This makes the problem more difficult. Some authors argue that in limited mobilization, citizens will have stronger preferences about what kind of controls are or are not tolerable, and these preferences are more likely to be honored than in full mobilization (Galbraith 1952, 59-60; Backman 1951, 19; Chandler/Wallace 1951, 504). Or perhaps limited mobilization actually calls for more compulsion:

> The lack of wartime patriotic fervor implies more compulsion behind economic policy. Not that unwilling majorities can be coerced. But compulsion is necessary to keep small unwilling minorities from getting rewards for non-cooperation, and setting up pressures which will undermine the willingness of the majority. With a long time to go, we have to be more concerned over the corroding temptations for both controller and controlled which arise when the controller has discretion over matters of vital importance to a firm (Hart 1951, 52).

Galbraith favors taking an approach of calculated political strategy, writing, "[e]nergies should now be concentrated on getting the kind of stabilization program with which we can live, if we must, for a long time. This requires that we control strongly where control is necessary and not at all where it isn't" (Galbraith 1951, 549) He focuses on "food, basic clothing, and rents," with the goal of keeping living costs in check to prevent wage-price spirals (ibid.). Additionally, while the WWII strategy was not particularly designed, but rather arrived at by evolutionary groping (Galbraith 1952, 45), in a longer-term limited mobilization, more deliberate strategizing must be done on the best way to meet mobilization and stabilization goals. Galbraith gives the example of clothing during WWII: the general ceiling on clothing prices led to producers shifting to high-end clothing when costs increased, meaning there was too much expensive clothing and not enough

ordinary clothing. He argues that a better strategy than a general price ceiling would have been to use allocation orders to divert raw materials into cheap clothing production, while letting higher quality clothing get expensive in order to discourage demand (Galbraith 1951, 549).

Conversely, if all goes well, then the mobilization period of the pandemic response should be relatively short. The strategy of "flattening the curve" implies that once the virus has been sufficiently slowed, quarantines can be let up bit by bit: if we expect that ultimately the disease will spread to every corner, then there's no reason to pursue transmission rates *slower* than what the healthcare system can adequately respond to. This flexibility reduces the amount of resource reallocation that would be needed compared to a major war. There will be some necessary redirection of resources into healthcare and general labor; and there will be shifts towards allowing necessities to be produced with increased social distancing. But otherwise, the main goals of a coronavirus stabilization policy will not generally be redirecting productive capacity. Rather it will be preservation of productive capacity in stasis until it can be brought back online bit by bit, with allowances made for the variety of ways we expect (and prefer) the post-pandemic economy to be structured differently than it was before 2020.

Demobilization

As the mobilization reaches its ultimate objective, the problem of the day turns to restoring normal peacetime conditions, both economically and socially. There are numerous challenges that must be overcome in the demobilization process, many of which are micro issues such as how to cancel contracts with private suppliers or how to reintegrate and retrain the workforce from producing mobilization output to civilian output. Here, I will focus on the macro issues, particularly inflation.

During World War II, a common expectation was that the inflation during the war would be followed by a post-war deflation, and that the larger the inflationary boom, the larger would be the deflationary bust — though this reasoning was based on the experience of World War I, it proved to be incorrect for World War II. (For examples of this sentiment, see Stoltz 1942, 170; Clark 1942, 15; Killough 1942, 232; for reiterations or critiques of this sentiment after it proved incorrect, see Thomas 1951, 628-629; Manning 1960, 49-50, 55; Galbraith 1952, 39-40; Backman 1951, 23). The postwar deflations of prior years had likely been due to the gold standard, which had been de facto abolished in the 1930s. But, with this expectation, economists and policy makers inappropriately gauged the inflation potential after the war, and indeed inflation became a pressing problem starting in 1946.

The root of the problem can be found in the choice of mobilization framework. With the exception of pay-as-you-go, each public finance framework described in the previous section coaxes increased output from producers by offering future rewards in the form of financial claims. These claims are accumulating during the mobilization period (at least to the extent that the authorities

can convince or compel people not to spend them), and form a backlog of pent-up savings, which are likely to be channeled into consumption goods at the earliest possible opportunity (Galbraith 1952, 52; Hart 1951, 55; Hart 1951b, 38, 111; Thomas 1951, 625, 628-629; Murphy 1950, 17). While this likely played a role in buoying the economy for a long time after WWII, in the immediate post-mobilization period it can create severe problems: with the danger over and patriotism waning, pressure to loosen policy and release direct controls will mount, at the same time as private industry will be re-tooling to produce civilian goods. In other words, demand is likely to spike before supply is forthcoming to meet it, leading to both price rises and unemployment — stagflation (see Levey 2019, footnote 20).

In a war, post-emergency inflation should be preventable with proper policy; however, the temporary re-adjustment unemployment may be inevitable, as it is caused by the unpredictability of the end of the conflict. For a Green New Deal, both problems may be preventable[19]. Both call for a gradual relaxation of controls rather than an abrupt termination (Galbraith 1952, 56; Manning 1960, 57). Rather than shifting from mobilization to civilian production on a given date, the GND should come with a "ramp-down" period in which public investment gradually declines to normal levels with resources shifting to production of consumption goods. This will allow employment to be kept high even as the economy transitions.

In terms of inflation, both measures to regulate demand (likely credit controls, taxes, and savings campaigns) and controls to regulate costs (any needed price controls or allocative measures) should be kept in place for as long as feasible while inflationary pressure threatens a danger. The question faced in the post-mobilization period will be how quickly pent-up savings should or will be released for consumption, and which other groups in the meanwhile should forgo claims to national output. One advantage, argued by Galbraith, is that as time passes, people come to view their savings as an emergency fund rather than unfulfilled demand, so stalling for time can reduce the ultimate inflationary pressure (Galbraith 1952, 55). Therefore, controls on demand and spending should be kept in the post-mobilization period, for a time which may be longer than the industrial reconversion period.

A brief word about national debt is in order. As mentioned earlier, the national debt represents a portion of these "pent-up savings." While national debt is sometimes portrayed in the popular media as "borrowing from our grandchildren" or the like, writers in the mobilization economics tradition have long recognized that this is untrue. For example, as Murphy states:

[19] Since a major component of the Green New Deal is a proposed Job Guarantee, unemployment would be a non-issue. The proceeding section could be read instead then as referring to non-JG employment, rather than total employment.

> The real costs of a war consist of the material resources which it exhausts and the effort put forth, the satisfactions foregone, and the pain incurred by the members of the community as a result of it. The great bulk of these costs must be borne currently as the war is being fought. Guns cannot be fired until they and their shells have been manufactured, nor can landing craft descend on the beaches until their parts have rolled off the assembly lines. The costs of making them — and of using them — cannot be postponed; they must be met currently (Murphy 1950, 60).

That is, because goods and services cannot travel backwards in time, they cannot be borrowed from the future, and this is true regardless of whether the government has a balanced budget or a deficit (CEA 1951, 523; Backman 1951, 24, 28, 62; Hart/Allen 1941, 80-81). What government liabilities allow for however is the possibility of re-negotiating the burden in the future, by providing real resources to persons who had previously gone without:

> ...the distribution of the real cost of a war in time — between past, present, and future — cannot be affected by the extent to which it is financed by taxation or borrowing. Borrowing affects rather its distribution among persons. It, in effect, gives certain persons 'recoupment certificates' for a portion of the costs which they have incurred or the satisfactions which they have agreed to forego during the war, and so permits the aggregate cost of the war to be distributed and redistributed in future years (Murphy 1950, 60).

If the demobilization is to be remembered as a success, this process too must be managed equitably.

For demobilization following the COVID-19 crisis, the greatest challenge will be ensuring that the private economy can functionally absorb workers re-entering once the quarantines end. That will depend critically on steps taken when the quarantines begin. While many businesses must shutdown for public health reasons, the question is whether they shut down by merely pausing business; or shut down by firing the workforce, selling capital assets, entering bankruptcy proceedings and relinquishing their business license. If we can accomplish the former, then the return to a normal economy will be all the smoother. If not, then we may face prolonged unemployment as there are no jobs to return to and perhaps inflation as there are no goods to buy - in addition to the disease which will still be with us. This is the nightmare scenario. We can avoid it by ensuring that businesses that will still be needed after the illness ends but which are under pressure today (particularly small- and medium-sized ones) can get the aid that they need to avoid liquidation.

What's Next for Mobilization Theory?

In general, while the economics of mobilization theory already present useful tools and concepts for managing the mechanical side of mobilization, in my view, there is much more work to be done on the social theory aspects. The mechanics are in fact inseparable from broader social considerations – e.g. workers likely will not be willing to cooperate with calls for sacrifice in the form of longer working hours, savings drives or wage controls if they feel that their employers are pocketing the proceeds of that sacrifice, meaning that something like an excess profits tax is critical to the success of any mobilization, not for technical or efficiency reasons, nor because it would do much to help with inflation, but for social concerns (Hart 1951b, 83, 110-111; Taft 1942, 63; Neal 1942, 13). In the case of the coronavirus crisis, if the terms of bailouts for the elites are too generous relative to what's offered to the masses, this may generate popular calls for punitive taxes on the wealthy, to claw this public money back from the profiteers.

Where should mobilization theory go more generally? Here are some important questions to consider: when is mobilization justified, and when should it be considered a form of repression? how large should a mobilization government be, and how can we ensure that it returns to "normal" when the danger is over? under what criteria should we trade off higher living standards for a slower mobilization? what can be done to encourage the necessary social unity required to tackle looming challenges through mobilization? how does mobilization affect various social groups differently? in what ways can mobilization disrupt pre-existing power structures, or in what ways does it reinforce them? what sort of governance structures are best suited to mobilization, to ensure both speed and accountability? when should "nudges" be employed to change behavior as opposed to compulsion or pleading? what are the legal structures that allow for these changes? when is international cooperation called for and how best should it be achieved? And, what are the dangers of mobilization?

On this last question we can offer a few hints: a botched mobilization could be devastating economically and socially. The dangers to the economy are a capital structure no longer suited to supplying civilian needs, general mass shortages, and destroyed work and savings incentive, all of which could fuel a runaway inflation. Rent-seeking and cronyism could badly damage social trust and further harm the most vulnerable. Conceivably a government could collapse if the situation deteriorated calamitously.

Hart also offers us some musing on the use of compulsion:

> Reliance on voluntary restraints means that a multitude of small decisions raise the question of cooperation versus non-cooperation. We rarely have any good way of gauging our 'reasonable share' of a scarce commodity, of a bond subscription or of military service. The result is that voluntary programs create a string of spurious moral issues, and leave people with a chronic bad conscience (Hart 1951b, 156).

This, plus the experience of seeing others 'get away with it,' "turns cooperators into non-cooperators" (ibid.) However, "[t]he worst trap in this field of issues is to set up programs that pretend to be compulsory but are in fact voluntary, or vice versa" (Hart 1951b, 157). For the former, he gives an example of a rationing system where the coupons are not taken out of circulation, making cheating easy. For the latter, he describes bond drives where people are pressured so hard to buy bonds that they borrow from banks or resell bonds they already owned in order to buy new ones, either of which defeat the anti-inflationary purpose of the saving campaign. Programs of this sort do serious damage to the social fabric. "It is important, of course, to leave areas where people can show their patriotism by voluntary sacrifices" (ibid.). But, Hart suggests that if we aim to employ compulsion only where it is workable and necessary, then there will still be plenty of opportunities for patriotic sacrifice.

There is also much room to explore the more social aspects of controls. As a small example, while it was understood that indexation of prices or wages can create the conditions for spiraling inflation (Harris 1951, 230-232; Hart 1951b, 67, 93; Clark 1942, 12-13,24-25), Hart (1951b, 83-84) also points out that depending on the circumstances, these agreements could actually *dampen* inflation, by providing peace of mind to workers that their living standard will be protected, and thus making negotiation and compromise easier. This is essentially the principle behind Keynes's proposal to index the 'iron ration' to inflation.

Conclusion

This paper has looked over some important contributions to mobilization economics, including discussions of programming, mobilization frameworks, and controls. Along the way, this paper has sought to modernize and synthesize these concepts and speculate as to how they would apply to a Green New Deal and the COVID-19 pandemic. It can only be to our benefit to learn from the lessons of the past.

The immediate imperative is to navigate the Coronavirus crisis. Then, the next steps should be to plot the course of a Green New Deal in more detail, and, more broadly, to pursue mobilization theory as a transdisciplinary study. Mobilization should be conceived of as a broader cultural and social process, rather than simply an economic build-out. This paper

has asked questions in these directions while sketching out a few preliminary thoughts. Of particular importance are the political justifications for mobilization, the political economy of controls, and the question of how to heal the pernicious social divisions so prominent today.

Appendix

Further quotations on public finance:

"It is often and truly said that no country will ever lose a modern war because it cannot find ways and means of financing it.... In one way or another the necessary money will be forthcoming to satisfy the needs of the government and its suppliers" (Brown 1942, 136).

"A Government, which has control of the banking and currency system, can always find the cash to pay for its purchases of home-produced goods" (Keynes 1940, 61).

"In one way or another, the necessary funds can be obtained regardless of a nation's financial strength. That financial strength is not a prerequisite to fighting a war has been demonstrated many times in history" (Backman 1951, 27).

"The war, of course, would have been financed in any event whether there had been a savings bond program or not. Modern nations do not turn themselves over to the enemy for financial reasons. The main objective of the savings bond program was to help stabilize the domestic economy" (Murphy 1950, 196).

"The main sinews of war are goods. As long as the required goods can be and are produced, the government can obtain them. In the absence of such production (or foreign sources of supply), even the strongest financial position may be of little immediate help" (Backman 1951, 28).

"The acquisition of the real means for war is therefore the primary problem of war economics. The financial program - how to pay for the war - should be determined with this end in view, not with a view to balancing budgets, conserving gold, or to most of the usual peacetime rules of orthodox finance" (Neal 1942,4).

"The general rule of all-out war finance is to 'take the dollar sign off defense.' This means that the ceiling to the total military program is set by resources available after providing a bare minimum for civilian uses, and merely financial limitations cannot be allowed to stand between the military and these resources" (Hart 1951b, 36).

"The central problem of war finance, without particular reference to the post-war situation, is how to restrain private consumption within the bounds set by the needs of defense" (Poole 1942, 93).

"The most obvious financial problem is that of supplying the government with enough money to pay for all the goods and services that can be made available for its purposes… This requirement can be met in various ways, including many combinations of taxes, borrowing, and the creation of new money by the government itself, by the central bank, and by the commercial banking system. The *real* problem of financial policy is not merely to raise enough money to cover government expenditures, but to raise this money in such a way as to facilitate the functioning of the economy and to avoid undue damage to the economy itself and to the various groups in it" (Chandler 1951, 14).

"The basic objective of budget policy is to bring down spending until it is in balance (allowing for spontaneous savings) with available supplies. This problem does not yield an absolutely clear-cut budgetary rule, since different taxes (and different kinds of government spending) vary widely and somewhat unpredictably in their effects on private spending. But for all that, there is a presumption that the inflationary gap and the Treasury's cash deficit are of roughly the same size" (Hart 1951b, 98).

For additional quotations along similar lines from the US Treasury during WW2, see Levey (2019).

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