

2

A New Framework for Macroeconomics

Achieving Full Employment by Increasing Capital Turnover

By MASON GAFFNEY*

ABSTRACT. Most forms of macroeconomics today, whether Keynesian or monetarist, presuppose that problems of economic instability can be treated as errors in financial management. Neither fiscal nor monetary policy recognizes the existence of systemic faults in the real economy that result in overinvestment in durable capital that turns over slowly, in contrast to forms of capital that interact more frequently with land and labor. Only by removing serious distortions in microeconomic relations can macroeconomic problems be resolved. The current global economic crisis exemplifies the limitations of policies that ignore distortions in the rate of turnover of investment capital.

I

Introduction

POLITICAL AND ECONOMIC LEADERS are looking for a quick fix for the current economic crisis. They are unable to find remedies, however, because their models presuppose that the economy is in equilibrium and that any disturbance is caused by an external “shock,” which is understood as a random event that could not have been predicted.

*Mason Gaffney has been a Professor of Economics at the University of California, Riverside for 33 years; e-mail: m.gaffney@dslextreme.com. He is the author of *The Corruption of Economics*, an explanation of how land became excluded from neo-classical economic models. He has also written extensively on various aspects of resource economics, urban economics, tax policy, and capital theory. A version of this essay was previously published as “Toward Full Employment with Limited Land and Capital,” pp. 99–166, in *Property Taxation, Land Use, and Public Policy*, edited by Arthur D. Lynn, Jr. ©1976 by the Board of Regents of the University of Wisconsin System. Reprinted by permission of the University of Wisconsin Press.

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In this case, the pundits are blaming subprime mortgage lending and other questionable business practices, as if they were foreign objects in an otherwise healthy system.

To solve the current crisis and avoid similar crises in the future, we start with a different premise. The economic problems we face today are not the result of personal foibles or random events. They stem from the misallocation of capital. The consequences of that misallocation have manifested themselves in regular cycles of expansion and contraction, which have recurred approximately once every generation in the United States since 1798 (and perhaps earlier). Of course, every cycle has its peculiar features, including people who engage in sleight-of-hand financial manipulations, but we should not be distracted by personality. The important story lies deeper, at the level of how capital functions in an economy.

The story behind the news is that lending for land and expansionary capital investment has repeatedly created a temporary euphoria of rising prices, only to be followed by a sudden downturn, in which asset prices fall, interest rates rise, and unemployment rises. Mainstream macroeconomists offer no explanation for the cause of this cycle, and their only remedy is to reinflate the bubble, to start the cycle again.

Meanwhile, we find ourselves in a condition aptly described by Henry George more than a century ago: "Though custom has dulled us to it, it is a strange and unnatural thing that men who wish to labor, in order to satisfy their wants, cannot find the opportunity" (George [1879] 1979: 270). The paradox of an economic system that disemploys people who wish to work and whose wants are not satisfied has still not been resolved. After more than 60 years of monetary and fiscal management, we are back at square one, facing a national crisis similar to the depression of the 1870s, when Henry George wrote, or the 1930s, when Keynes wrote.

Federal fiscal and monetary policies, alongside recent bailouts of financial institutions, prove powerless to restore economic activity and soak up surplus labor. Prominent economists seem confused and helpless when faced with the most basic malfunction of the system, that is, shortness of work tied to a contraction of credit. Why cannot these idle persons find work to fill those shortages? If economics

cannot solve this elementary but stubborn riddle, it is not good for much.

The thesis of this essay is that contemporary macroeconomics is based on faulty premises, and the policies based on those premises have led us astray. The spending and investment cures that leaders apply in cases of economic contraction are not cures at all. They are the source of the problem, so the harder they try to solve the problem, the worse they make it. That does not mean the classical remedies—increased saving or wage cuts—will solve the problem, either. What is needed is a new approach based on vital distinctions that have been overlooked. Rather than thinking simply in terms of “more” or “less” spending, taxing, or capital investment, we need to re-examine the effects of different kinds of capital investment on employment and the ways in which taxation has discouraged the right kinds of capital investment.

The beginning of wisdom on macroeconomics starts with the recognition that some forms of capital displace workers and other forms enhance employment. It is not necessary for government officials to sort through lists of capital investments to make this determination. The market can do so quite well on its own, if it is coaxed to do so by the right incentives. As we shall see, different kinds of taxes have quite unexpected impacts on the ways in which land and capital are combined with labor. The choice between full employment (with labor-enhancing forms of capital) or financial crisis (with labor-displacing forms of capital) is largely a result of which tax policies are adopted as well as the kinds of direct capital investments made by government agencies. This essay will deal with general principles and with taxes. Methods of selecting appropriate government capital projects are discussed only in passing.

A. Paradox: Idle Labor, Shortages of Capital, and Land

The paradoxical condition of work needing to be done and workers not being allowed to do it cannot be considered in isolation. The problems we now face did not come upon us suddenly. They have been building for years.

Real wage rates in the United States have lost ground since 1973, particularly in relation to the price of housing. The United States used to be the employment mecca of the world, but in the past three decades, an increasing number of jobs have been “outsourced,” shifted to other countries. We are unable to absorb the same workforce that was employed a few years ago.

At the same time, the other sinews of production, capital and land, are growing short, and very dear. The price of land for housing was recently bid up to absurd heights before it collapsed and brought down the financial house of cards that was fueled by housing speculation. In the wake of the boom and bust of the housing market, capital financing is particularly hard to obtain.

Materials prices are high, particularly the price of energy. The price of oil in 2009 has fallen from the 2008 peak, but only because of the recession. After spending billions on two wars in Iraq to secure oil supplies, American consumers were still paying between \$3 and \$4 per gallon for gasoline in 2007 and 2008. In nominal terms, gasoline prices more than doubled between January 2005 and the summer of 2008 (U.S. Department of Energy, Energy Information Administration 2009: Fig. 2).

The required complement of land and capital per worker and consumer has risen sharply for many years, much more quickly than the workforce. So now we are bumping into the ineluctable logic that if we require a vast complement of resources per worker, and require jobs for all, we will chew up lots of resources, and push on the limits of the Earth. We will push up materials prices; we will pollute the environment; and we will provoke our neighbors by coveting their raw materials. We will push on the limits of our capital supply, too, unless it grows faster than it has been growing.

Along with short work, we face a swelling array of secondary evils: crime, protracted apprenticeship periods, soaring welfare and dependency, forced early retirement, imperialism to make jobs and acquire raw materials, pork barrel politics, seniority, suppression of competition, exclusionary local codes and zoning, and rejection of the free market. All these evils have their independent roots, but are inflated by unemployment and the fear of it.

Some unemployment is iatrogenic; that is, caused by the doctor. Critics of welfare point out how welfare payments have boomed into

a cause of unemployment. For 25 years since the publication of *Losing Ground* (Murray 1984), conservatives have attacked welfare as the root of most evils in American society. But before anyone blames welfare, we should first analyze why we have been unable to solve the perennial problem of a system that prevents 4 to 8 percent of the population from work (and a much higher percentage in low-income neighborhoods). Since work shortage also serves to rationalize welfare, we have a vicious circle. But there is little doubt which came first, nor is there much doubt that we can solve the problem humanely only by opening more jobs, regardless of the direction of welfare reform.

Each of the secondary evils, like welfare, could be a study in itself. Yet until we face the elemental riddle at the fountainhead of all this trouble, each such study only diverts us from meeting the ultimate challenge for economists that George posed in 1879.

B. Recent History of the Failure of Macroeconomics

By the end of the 1970s, there was a general recognition that fiscal and monetary policy had failed. Instead of “fine-tuning,” we had “stagflation.” Keynesianism foundered as it steered between the shoals of inflation and the rocks of unemployment and ran onto both at once. The so-called New Economics taught that that would not happen. “Fiscal Policy and Full Employment Without Inflation” was the promise (Samuelson 1955: 336), and the world believed it. Samuelson (1955: 350) wrote of the new “mastery of the modern analysis of income determination,” and of the “momentous Employment Act of 1946 . . . to fight mass unemployment and inflation.” Inflation could result mainly only from “overfull employment.” All that turned to ashes in the crucible of 14 percent inflation in 1979, which was brought under control only by double-digit unemployment. For a couple of decades, in the 1980s and 1990s, it seemed that Keynesianism had died. However, in the past year, it has come into vogue again, in response to the current credit contraction.

Economists of influence seem capable of little but following Pavlovian responses learned in school: in a word, that the way to make jobs is to recycle money faster. Most of what we call macroeconomics

today is an embroidery on that one simple theme, the simplicity hidden beneath elegant variations and elaborate circumlocutions that dazzle and boggle and addle without adding much substance.

The “New Economics,” when new in the 1950s, was positive and optimistic, and promised a lot. There were free lunches in those days—when you put the idle to work, there is such a thing. The Puritan ethic was the goat, obsolete and absurd, dour and dismal. But by the 1970s, the New Economics had become a New Dismal Science, a science of choice in which all the choices are bad. The pessimism was rooted in the Phillips Curve, an observed tradeoff between unemployment and inflation. Paul Samuelson (1970) summarized the dismal sentiments of that era when he opined: “One must face up to the bitter truth that only so long as the economy is depressed are we likely to be free of inflation.” This was not bread, but a stone.

Conservatives offered the same tradeoff in even starker terms. Milton Friedman (1968) and Edmund Phelps (1968) independently reached the same conclusion: that any effort to reduce unemployment and raise real wages through demand management must necessarily lead to a higher rate of inflation and a consequent reduction in real wages. The “natural” rate of unemployment or NAIRU (non-accelerating-inflation rate of unemployment) was the level of unemployment at which the economy would be in equilibrium. They argued that the Keynesian tradeoff between inflation and unemployment was largely a mirage because any reduction in unemployment would be temporary and would simply inject inflationary pressures without any corresponding social benefit. The conservatives could gleefully announce that “this is the best of all possible worlds” and that any efforts at improvement will merely cause greater suffering.

Since conservatives recognized that policy could allow for short-term variations around the long-run equilibrium, policy making after 1968 settled into a grim choice on which conservatives united with liberals. They differed mainly on whether to allow more unemployment or more inflation. There was little challenge to the conceptual framework. Controlling spending was all that mattered. Monetarists debated Keynesians over the most effective way to regulate spending, and were more disposed to favor less of it, and recognize other constraints. Yet neither side much deviated from the premise that

spending money is the governor of the economy, the autonomous force that other activity obeys, the key of control. As Otto Eckstein summed up the situation in the 1970s:

The collective intelligence of the economics profession is unable to fundamentally restructure the intellectual substance of the field. . . . We have a theoretical apparatus that can be used for a wide variety of things. There is no other way, and I do not think we know how to find one. (1974: 56)

The one new idea that entered economic debates in the 1980s was the Laffer Curve, the assertion that tax cuts would solve problems of scarcity by increasing output, as if there was no limit on the “free lunch” offered by Keynesians. In a sense, this was a welcome relief from the debates over the Philips Curve and NAIRU, which imposed a straitjacket on economic policy. At bottom, though, it was more of the same. The Keynesians, the conservatives, and Laffer all agreed that the manipulation of aggregate spending was all that mattered. They all implicitly concurred that the real economy no longer mattered.

II

Why We Need a New Form of Macroeconomics

EVERY VARIATION on the general theme of monetary and fiscal controls has led to disastrous policy results: periods of inflation followed by periods of high unemployment, with high levels of resource consumption in both periods. The problem is that the practical solutions have been based on an intellectual foundation that de-emphasizes causal factors in the real economy that combines land, labor, and capital.

A. The Origins of Macroeconomics

Modern macroeconomics evolved under a different set of problems than we face today, and its founders built into its vitals a number of special premises and limitations. It is geared to assume no or few resource constraints, and has little response for the new challenges of environmental limits and scarce raw materials.

“Growth” is one of its ideals, and simply to make jobs in a stable equilibrium independent of growth is outside its purview. Geared to approve waste, it has nothing for emerging needs to conserve scarce

resources. Geared to define the economic problem as how to dispose of surpluses, it ill becomes a world of excess demand and short supplies. Geared to treat capital as a glut, and the central economic problem as how to dispose of excess saving, it is at a loss with capital shortage in the form of either credit constraints or high interest rates.

Geared to treat both resources and capital as cheap, it all too easily lets labor be treated as the only cost of production worth mentioning—a new labor theory of value—and ignores distribution. It plays into the hands of anti-labor interests by picturing inflation in terms of a “wage-price spiral.”

Macroeconomics today ignores the possibilities of substituting labor for land and capital. Geared to idealize federal spending, it drifts easily into mercantilism and imperialism, especially in the more idealistic, missionary phases of “economic development.” Geared to accept and live with concentration of wealth and economic power, it has little to say about the effects of industrial mergers in substituting capital for labor by putting plants on standby and “outsourcing” jobs. It has no basis for condemning the monumental waste of capital in urban sprawl, or the global sprawl of imperialism, because each inflated need is an investment outlet. On the contrary, continuous territorial expansion and development are its answers to the limited land supply.

A design feature in the apparatus of modern macroeconomics is that the best way to recycle stagnant money is to find investment outlets. Since the rate of profit is always threatening to push zero, such outlets are to be cherished, and we should subsidize and force-feed investment if needed, as by loans at low interest, to keep money recycling. If we stack up layers of capital at low productivity, that is no problem. Seminal investments like roads and water supplies that open new lands are best of all, for they induce ancillary investments that recycle yet more stagnant money.

Boondoggling is all right because it makes jobs, and if it soaks up a disproportionate quota of capital per job, that helps dispose of excess saving. In all of these ways, demand management principles seem designed as the perfect “straw man” for Marxism, which predicts that “capitalism” must fail because of the declining return on capital. In fact, the problem is not so much “capitalism” as particular policies

that weaken a market economy by treating every problem as a form of underconsumption.

B. The Half-Truths of Macroeconomics

The result of the conventional belief that indiscriminate injections of money or capital investment into a sluggish economy is a panacea has been to let a thousand policies bloom that foster substituting capital for labor. This finds support from some other errors or half-truths, left over from the old economics, that die very hard.

*1. Half-Truth #1: Adding Capital to Increase Labor Productivity
Raises Wages*

One of these half-truths is to define “productivity” along a single dimension, as output per worker. Of course, this is an important measure, since wages are related to this measure of productivity. The premise behind the present focus on labor productivity is that adding energy, land, and capital to each unit of labor will make it more productive—and raise wages. This conserves labor and uses resources and capital. However, real wages have not risen since 1973, despite enormous growth of per capita GDP. That should have made it clear that a one-dimensional approach to productivity fails utterly.

In addition, as a society, we also value the natural world, so the conservation of energy, water, and land are also important. The conventional approach of macroeconomics squanders resources in order to maintain full employment, but that is not necessary. In fact, it is counterproductive. To the extent that resources substitute for labor, resource conservation can raise wages and employment. At present, we reduce wages by allowing resources to be squandered.

Only in the last few decades, with the birth of the concept of total factor productivity, and the new emphasis on energy efficiency, are most economists beginning to escape the limits of a single-minded orientation toward labor productivity, with its built-in bias against use of labor. Substituting capital and land for labor raises “efficiency,” so conceived, only by wasting capital and land, and is only efficient in unrealistic models in which land and capital are underpriced or ignored. High labor efficiency then means low land efficiency and low

capital efficiency, either directly or at one remove in the form of low energy efficiency, low water efficiency, low feed-grain efficiency, and so on.

Misled by this concept, we have exulted in high output per person as a symbol and measure of national and company “productivity,” and accepted an extreme substitution of capital and resources for labor. The well-known displacement of farm labor is not an exception but more like the rule. John Kendrick (1961: 148–149, Table 39) calculated that the ratio of capital to labor for a large group of industries in the United States rose at an average annual rate of 1.3 percent from 1899 to 1953. That means that the capital intensity of labor (the capital/labor ratio) doubled during that period. The growth of capital intensity rose to 1.9 percent per year in the 1950s, to 2.7 percent in the 1960s, 2.3 percent in the 1970s and 1980s, 3.2 percent in the 1990s, and 4.3 percent from 2000 to 2007 (more than three times the rate in the first half of the 20th century). The result was a doubling of capital intensity between 1950 and 1980, and another doubling from 1980 to 2004 (U.S. Bureau of Economic Analysis 2009: Tables 2.1, 2.2; U.S. Council of Economic Advisers 2009: Table B-35). Thus the rate of substitution of capital for labor increased throughout the 20th century, but it succeeded in raising real wages for only the first 70 years.

Private, nonresidential capital was not the only type of capital that grew relative to labor inputs. The standard estimates of capital intensity omit government capital (roads, dams, schools, and other public buildings), the infrastructure into which we have poured so much public treasure at low interest rates. (From 1950 to 2007, government fixed capital per capita grew by about 430 percent, or 3.0 percent per year, a growth rate about 10 percent higher than the growth of private capital per worker.) The figures for private capital also omit housing, which soaks up so much capital per job created. They omit the recreation boom, which requires so much more land and equipment per consumer hour, and per measure of personal joy, than the quiet pleasures of yesteryear. And they omit the swing of consumers toward goods and services like electric power and natural gas, whose production is capital-intensive and whose prices fall relative to labor-intensive products when the capital input is subsidized.

Table 1
 Energy Efficiency in Dollars of Value-Added per
 Kilowatt-Hour (VA/KWH) for Selected Industrial Groups*

Industry Group	VA/KWH	Industry Group	VA/KWH
Cookies & crackers	0.91	Blast furnaces & steel mills	0.033
Book printing	0.50	Primary copper	0.020
Millwork plants	0.36	Paving mixtures	0.018
Wood furniture	0.28	Paper mills	0.016
Fluid milk	0.13	Pulp mills	0.015
Frozen fruits & vegetables	0.12	Petroleum refining	0.012
Yarn mills	0.12	Sawmills	0.008
Aluminum rolling & drawing	0.048	Brick	0.008
Wool-weaving mills	0.048	Primary aluminum	0.007
		Cement, hydraulic	0.006
		Lime	0.004

*KWH equivalents used where relevant.

Source: Wilson (1974).

Capital was not the only factor applied wastefully in combination with labor. Producers also used a great deal of energy as inputs to manufacturing processes. They were particularly heedless of energy costs prior to the first OPEC oil embargo of 1973. Table 1 shows the amounts of value-added resulting from energy inputs in various industrial processes, as of 1967. In general, food processing and other secondary processes use about 10 percent as much energy per dollar of value-added as processing of raw materials.

Until 1973, we substituted energy for labor and called it progress and efficiency. After 1973, industrial and commercial uses of energy per worker declined to 1950s levels, but energy intensity (energy used per dollar of value added) in the United States remains about 35 percent higher than in other advanced industrial nations such as France, Germany, and Japan (U.S. Department of Energy, Energy Information Administration 2006: Table E-1p).

A comprehensive accounting of our lavish input of capital, energy, and land per worker would reverse the common stereotype that labor unions invented featherbedding. In every sector of our economy, we have been extravagant and wasteful in our use of physical capital and resources.

2. Half-Truth #2: Capital Always Complements Labor

The second supporting ancient half-truth is that capital cannot really displace labor in a vertically integrated whole economy because labor produces capital anyway. In other words, if we think of capital goods as objects produced by labor, then investment in capital necessarily entails an investment in labor as well. According to this logic, it is impossible to displace labor by producing more automated factories because labor is required to build those automated factories. This is the counterpart of the modern macroeconomist's concept that investment employs labor. According to that view, all capital is like a hammer: it enables a worker to perform more effectively by complementing labor and increasing the value of labor. The idea that some forms of capital might substitute for labor and reduce wages and employment does not enter the picture. Either way you perceive it, the meaning is that benefits to capital are passed through to labor.

That is a half-truth, and the untrue half has helped lead us into our present crisis. The problem is that capital can substitute for labor. This poses a problem for two distinct groups: those who favor fiscal policy to create jobs by investing directly in capital projects (public works), and the supply-side tax cutters who want to induce more capital investment by cutting the tax on capital gains.

There is considerable overlap between the two groups. The fiscal managers say investment creates jobs, so they generally favor policies that subsidize investment. Supply-siders tend to oppose direct government investment in capital. Instead, they would remove taxes on capital. But many Keynesians in the 1950s and 1960s also favored lower taxes on the income from capital, using the investment tax credit, expensing of capital investments, accelerated depreciation, and exemption of imputed income of homeowners.

In some respects, Keynesians are similar to Georgists who seek to reduce taxes on capital at the local level by exempting buildings from

the property tax. Jack Stockfish (1957: 38) had the insight to point out years ago that these Keynesian inducements to invest were Georgist ideals applied to the income tax.¹ Both Keynesians and Georgists share the idea that benefits to capital are benefits to labor.

But a great deal of the cash and service flow from capital imputes to capital, as such, as interest. The longer the life of the capital item, generally, the larger share that is. A great deal of interest is internalized and invisible, hence too easily overlooked and forgotten. But a couple of simple examples should make the point.

When one buys a durable good on an installment plan, such as central heating and air conditioning for a home, if the payments were to stretch out beyond 15 or so years, more than half the total is interest. Let us suppose the installed system costs \$4,000. A \$4,000 loan for 20 years at 10 percent interest will be paid off in yearly payments of \$463.21 (11.6 percent of the principal). The total payments will be $20 \times \$463.21$, or \$9,264. Since the principal is \$4,000, the total interest charge would be $\$9,264 - \$4,000$, or \$5,264, which is 57 percent of the total payment. Even at 8 percent, the total interest charge would still be slightly over half of the total. At 10 percent interest, the total interest charges could be substantially reduced by paying off the loan more quickly. By liquidating the loan in 10 years instead of 20, the total interest would be only 37 percent of the loan.

This fits with our intuition. If you borrow money from someone, the longer you take to pay it off and the less you pay each time, the larger the amount of principal on which the interest accrues in each loan period, so the more total interest you pay. (At the limit is an interest-only loan, which would last forever because the principal is never paid, and 100 percent of the payments are for interest.)

Since the lessons from this simple example play a significant role in the analysis to follow, I want to dwell on them for a moment. The experience here is a commonplace one for anyone who has ever had an installment loan. The idea that long-term loans involve payment of a larger amount of interest is also not novel for most people. Yet the implications of these simple facts have been systematically ignored in economic theory as it applies to capital investment. If capital is tied up in long-term projects, more of the yield goes to pay interest, and less is left over for the cost of producing the capital good (the car, the

house, the equipment), particularly for the labor that goes into making it. This has tremendous implications for the ability of capital to promote employment or to stifle it.

The example above shows how the cost of a mortgaged house, or a debt-financed highway, or a debt-financed war can be mainly interest. But even if these are not debt-financed, they cost interest—the interest foregone on the equity capital.² Thus, if you live in a house, even if you own it free of a mortgage, you are giving up the income you could make by investing the equity in an alternative investment. Let us suppose that over a 50-year period, you could receive an average annual return of 8 percent on a \$200,000 investment, compounded monthly. At the end of 50 years, you would have almost \$816,000, or a “profit” of \$616,000. Owning the \$200,000 house instead, and not investing that money in the alternative investment, thus costs you that much in foregone revenue. So, whether you buy the house up front with cash or take out a mortgage, the result is equivalent. In one case, you have an out-of-pocket expense of \$616,000 on interest (about 75 percent of the total cost); in the other case, you give up \$616,000 in lost revenue.³ (Since you would have to pay tax on the invested returns on stock, but you do not pay on the imputed return to owning the house, you can see that the tax code gives a huge benefit in avoided taxes to those who buy property and hold it.) Accordingly, it is understandable that housing starts are more sensitive to interest rates than to any other cost.

But note now how little of the salable service flow is produced by labor. If 75 percent of the cost of building a house is interest payments, only 25 percent is available for everything else: materials and labor. Since onsite labor is only about one-fifth of the construction cost, labor is only 5 percent (one-fifth of 25 percent) of the total cost. If you watch a house being built, it might seem that labor is a large part of the cost of building it. Based on that visual impression, it might seem that boosting housing construction is a good way to increase employment. But these are illusions—the kinds of illusions that cause us to invest in the wrong kinds of activities if we want to achieve full employment.

If 15–20 percent of the cost of building a house is in the materials, perhaps we can find some labor added to capital at the stage of

producing those building materials. As it turns out, the labor involved in producing the lumber used in houses is insignificant. Lumber comes from trees that take decades to grow, and as we have just been reminded, long-lived capital represents mostly a return to capital investment and very little labor input.

On the face of it, growing trees may not seem like a form of capital investment, if we are accustomed to think of capital in terms of machinery, warehouses, computers, or inventories. But, in fact, growing timber is capital formation in its purest form.⁴ When a company plants a tree farm, it does so with the expectation of making a return equal to an investment of an equal amount in some other venture. Let us imagine that investment of a dollar in an alternative would yield 8 percent, so that a given amount of investment in a tree farm will yield that much. On that basis, we will assume a known financial yield in advance, ignoring the change in lumber prices likely to occur during the life of the standing timber. At the end of nine years, an investment of \$100 yielding 8 percent compounded annually will double to \$200. It will continue doubling every nine years, so that it will be \$400 after 18 years, \$800 after 27 years, and so on. Let us suppose that the harvest time for a given stand of second-growth trees is 63 years, which means seven doubling times. Since 2^7 is 128, the initial \$100 investment will have a value of $128 \times \$100$, or \$12,800. Of that amount, \$100 is the initial cost of planting and \$12,700 is the value added by capital formation or compound interest. Thus, $12,700/12,800$, or slightly over 99 percent of value added, comes from capital, and slightly less than 1 percent comes from labor.⁵ (If tree planting is a capital-intensive operation, far less than 1 percent comes from labor.) Of course, harvesting, hauling, milling, and selling apply more labor to add value, so lumber value embodies a higher share of labor value than timber alone. Still, timber is a splendid second example of capital-intensity in which it is largely capital, and not labor, that produces capital.

Timber growth is a good example of "passive investment." It is internally financed in the most literal way. Each year's growth is a product, an income to the owner, that is automatically invested in growing stock, adding to capital. But this investment employs no labor. It only employs capital and land, that is, growing stock and site.

Mature timber, finally, has not been produced by labor so much as by capital—the young growing stock—and land. Preferential tax treatment for timber, then, is a good way to make work for capital but a bad way for labor. Capital-gains treatment of timber sales, expensing of interest and property taxes, and preferential low property tax rates and assessments for timber tie up capital in the slowest of cycles and fence off land from labor, except once a century or so when the crop is cut. The job-creating efficiency of capital frozen this way is very low.

3. Half-Truth #3: A Fixed Amount of Capital Is Required for Each Job to Be Created

A third ancient error is that it takes a fixed quota of capital to “create” a job, visualized as a kind of niche made of capital in which we place one worker. The Obama plan to increase employment by investing in “green” infrastructure is based on this premise, as if each job required the investment of a specific amount of capital.⁶ The idea that “capital creates employment” is also the basis on which economists attack capital gains taxes. They argue, with only limited validity, that the tax reduces capital investment and thus stunts employment growth.

If the premise were true, of course, then the way to make jobs is to create capital, case closed. But in fact, factor mix varies over a wide range. A little bit of land, labor, and energy can mix with a lot of capital, or any other combination. The timber-growing example above amounts to a lot of capital and few other inputs. A sidewalk hot dog vendor with a pushcart exemplifies a lot of labor relative to land, capital, and energy. There are many combinations between those two extremes. That means policies, such as the Obama infrastructure program, that are nominally intended to create jobs by adding capital may actually have the opposite effect by absorbing capital in uses that generate very few jobs.

Capital is capable of complementing labor, but the extent to which it actually does so depends entirely on how it is invested and used. It is a serious mistake to assume that adding capital will add jobs. The value of capital to labor depends on how active the capital is. In this case, “active” means the extent to which capital combines with labor,

either in use or in the process of renewal or maintenance. Looking ahead, we will see that each time capital is recovered and reinvested, it can recombine with and reactivate labor. But torpid capital, like that in trees, many public works, premature exploration for minerals, suburban sprawl, and so on, is withdrawn from abetting labor.

Capital may preempt land as well, as the landlords' sheep did in 16th-century England by removing land from more labor-intensive forms of cultivation.⁷

*C. Basic Principle of a New Macroeconomics:
Increasing the "Valence" of Capital*

These niceties have almost entirely escaped modern capital theory because they require paying attention to the reality behind the symbols that tend to hypnotize economists. In the growth models of and following Harrod (1948) and Domar (1957), macroeconomists have been quite comfortable with assumed constant ratios of capital to output, as if all capital were uniform in its relationship to labor. Growth was linked closely with capital formation. This harmonized nicely with the assumptions on which the Obama infrastructure plan is based. It has served to reconcile the Marxist streak in demand-side economics with the puritanism of capitalists. Alongside the Marxists, who have repeatedly (and incorrectly) foretold the declining marginal productivity of capital for over a century, the Keynesians and their allies viewed growth as an escape from the doom of oversaving. The capitalists, meanwhile, saw capital investment as their social duty, which rationalized the social value of entrepreneurs and investors and helped aggrandize their functions, prerogatives, incomes, wealth, and status. It has been a curious but powerful partnership, hardly ever challenged by economists.

It has had to exclude, however, from its intellectual substance and theoretical apparatus the good news buried in a few obscure pages of Wicksell (1934: 194–196), that capital can increase its "valence" (to borrow a chemical term) for labor easily, and combine with more or less, in response to relative prices. (This does not mean that a given piece of capital equipment, such as a factory building or a tool-and-die machine, can be used to employ more or less labor as a complement.

It is possible, however, to choose different types of capital equipment or buildings, some with long life, others with a shorter life. That is what Wicksell had in mind by saying the valence for labor could be changed easily.) We may not need to find a new theory, but to resurrect one. Like any entrenched system, macroeconomic orthodoxy was unassailable when things went tolerably well, regardless of its merits. Now that we face a global crisis of unemployment and the proposed solution is to pour on capital without regard to its “valence,” it is time to review and reconstruct. The “New Economics” has grown old, and has become a terminal case. It had to break down because it was superficially based. The suffering is not welcome, but the opportunity for review is.

What is needed now is an entirely different approach to macroeconomic problems, an approach that takes account of different types of capital, and the effects of those differences on bottlenecks in the real economy. The Keynesian solution to a stalled economy is based on symptomatic relief using a “one-size-fits-all” monetary approach that ignores the underlying cause of economic problems. In effect, Keynes said, when there is not enough liquidity, increase the flow of money. When people are not buying goods being produced, increase effective demand by spending more money on government projects.

This is not my caricature of Keynesian economics. It comes directly from one of its proponents, Nobel Prize winner Paul Krugman. In his “Introduction to Keynes’s General Theory,” Krugman (2007) writes:

Although Keynes speculated about the causes of the business cycle in Chapter 22 of *The General Theory*, those speculations were peripheral to his argument. . . . Rather than getting bogged down in an attempt to explain the dynamics of the business cycle, . . . Keynes focused on a question that could be answered: . . . given that overall demand is depressed—*never mind why*—how can we create more employment? (Emphasis added.)

If Krugman is correct, then Keynes offered us a technical fix to a problem without any “attempt to explain the dynamics of the business cycle.” If *The General Theory* does not even attempt to explain causes, how it can it possibly be “general”?

D. Environmental Benefits of a New Macroeconomics

Faced with a surplus of labor (high unemployment) and a shortage of land and capital (i.e., difficulty obtaining credit to buy either), an obvious way to adapt is to substitute labor for land and capital, at the margins of course, making all processes more labor-using. Thus we would increase the use of labor without pushing on the limits of the Earth, without invading others' land, and without needing more capital. It would be too crude and harsh to say that the wars in Iraq were a direct outgrowth of macroeconomics. Nevertheless, by ignoring the impacts of capital investment on the environment and resource consumption, post-World War II macroeconomics has been a contributing factor in the logic of imperialism.

It is not a question of stopping growth. There is no need to divide into factions for and against growth. We can grow by combining more labor with the same land and capital. It is simply a matter of modifying processes and products and consumption. Each time capital recycles it can embody new techniques as well. Growth of capital is not needed for progress; turnover is. Since one way to substitute labor for capital is to turn over capital faster, this also accelerates embodiment of new knowledge in real capital.

The principle that more rapid capital turnover would be socially beneficial may not be intuitively obvious. We perceive waste in physical terms—the amount of material we throw away because it has outlived its usefulness. We favor products that last a long time, and have contempt for shoddy goods and planned obsolescence. We admire houses that have lasted more than a century, and look down on cheaply built houses that will collapse in a generation or two.

Higher turnover of capital might seem on its face to support waste by encouraging investment in capital with shorter economic lives. That does not have to mean shoddy construction, however. In the case of buildings, which represent over 70 percent of the fixed capital stock in the United States, the physical meaning of higher turnover would mean more money spent on frequent maintenance and restoration. The replacement of capital does not have to take place by demolition and reconstruction from the ground up. It can also take place by repair and reuse. Even more important, from the perspective of the

environment, each turnover allows the introduction of energy-saving technology. The introduction of “green” technologies of the sort promoted by Amory Lovins (Lovins et al. 2005) is hindered by the slow turnover of the stock of buildings and other capital equipment. A higher rate of capital turnover would enable reconstructed buildings to embody more environment-friendly building materials and insulation.

This study develops a thesis that we can employ ourselves as fully as we wish without any of the unpleasantness we now suffer in the name of jobs: without inflating, without borrowing, without fighting, without polluting, without any compulsion to grow, develop, and expand, without wasting, without price and wage controls, without invading more wilderness, without impoverishing posterity, without socializing labor or capital, without dirigisme, without giving up freedom, and without overspilling our national boundaries. Economic policy can offer better than dismal choices.

The problem is too much displacement of labor. It is “too much” because it results from biased institutions, a large set of them, operating over many years, that artificially induce substituting land and capital for labor. The way to solve the problem is to identify and remove the biases. This will increase demand for labor without requiring any more resources or capital.

No special rate of growth is required. We simply need to grow (or even not grow) in such a way as to combine each worker with less land and capital than now, to run with a leaner mixture of wealth, richer in labor. Until now, our policies have been strongly biased against the full employment of labor. Correcting this failure should not entail making the opposite mistake by arbitrarily restricting capital investment or creating make-work jobs to absorb labor. The sort of directive policies favored by socialists and proponents of “industrial policy” are not needed. We will invariably go wrong if we imagine that the plans of a few experts will be superior to the millions of decisions made daily by economic actors in the course of normal transactions.

The operation of a free market with flexible prices to serve as equilibrators can restore the right balance between labor, land, and capital, if we will simply let the market do its job. The idea is to make jobs not by waste but in the process of mixing inputs more efficiently.

This is the very sort of thing that a flexible economy can do. A wide variety of policies create an institutional bias against labor. Regulatory standards often require particular forms of capital equipment, even though a different mix of labor, capital, and land might be more efficient. In this essay, I will confine myself to taxes and subsidies that distort relative prices of inputs and promote wasteful use of capital, land, and resources.

Policies that create incentives to substitute labor for capital will achieve “structural” changes throughout the economy. I am proposing a new approach to macroeconomics because it addresses all of the conventional issues: unemployment, price stability, fiscal policy, and monetary policy. But this new approach refuses to stay in the pigeon-hole of “macroeconomics” because it simultaneously achieves goals of resource conservation, environmental protection, and social equity. It achieves those latter goals indirectly through faster recovery of capital and faster ripening of capital into final goods. The first increases the rate of reinvestment; the second increases the flow of consumer goods. Thus the “structural” substitution is a macro-economic effect of the most central kind.

E. Austrian-Georgist Roots of New Macroeconomics

The new approach to macroeconomics that I am following derives from two strands of economic tradition: (1) Henry George’s theory of how macroeconomic instability, including unemployment, is associated with an artificial scarcity of land; and (2) the insights of Austrian economic theory that emphasize the substitutability of capital for labor and the instability caused by lending on capital with slow recovery periods.

Although the followers of Henry George in the 20th century primarily focused on the incentive effects of shifting the property tax from buildings to land, his theory has macroeconomic implications of global significance. He showed that land ownership tends to absorb investment and cause an economy to freeze periodically, which constricts the employment of labor and impoverishes workers. By taxing land, the passive factor, and removing taxes from active factors, such as labor and capital, it is possible to thaw the economy. George

said there was no limit in a truly free economy on jobs, other than human desire for the fruits of work. This theme commanded attention because that was the problem that needed solving, even as today. He wrote his most famous work, *Progress and Poverty*, in the depths of the depression of the 1870s, which was as severe a contraction as the 1930s—or as the present crisis seems likely to be. With some modifications, his advice remains as relevant today as it was during that depression.

Again, like the Keynesians, George was weak on capital theory. He treated capital as an extension of labor rather than an independent factor of production. He saw their interests as united and set off against the interests of landowners. He overlooked the substitutability of capital for labor, which looms so large in Austrian School economics. Keynes and George alike treated the Austrians as their natural enemies, an unfortunate and needless impoverishment of their respective philosophies. The oversight in George was not so serious because he wanted to remove taxes on labor, not just on capital. The oversight by George's followers is serious because their emphasis has been on removing property taxes on buildings. But if we shift property taxes away from capital and continue to tax payrolls, we stack the cards against labor and bias the system to substitute capital for labor. It is important, as George said, to use more workers per unit of land and primary products. It is also important, as he did not say, to use more workers per unit of capital.

III

Combining Land, Labor, and Capital for Macroeconomic Health

IT IS NOW TIME to show how the economy could be reconfigured to avoid the dramatic oscillations that create false hopes and shattered dreams. My approach is not dramatic. My premise is simple: the economy would effectively regulate itself if distortions caused by faulty tax policy and public investments could be removed. To support that thesis, I have four points in what follows:

1. Factor mixes vary over a wide range and are by inference sensitive to relative costs and other stimuli like tax bias. The key

to intelligent macroeconomic policy is nothing more profound than enabling the factor proportions in production of both private and public goods to respond to the right signals. This is an idea that has been well developed in microeconomics, but it has been surprisingly neglected in macroeconomics.

2. Tax bias force-feeds land and capital into the production mix but militates against labor. Those tax biases are not obvious because the harm they cause is associated with a variable that has been largely overlooked—the rate of turnover of the nation's capital stock.
3. Demand for capital is not a sufficient or even necessary condition to make jobs. It often helps, but there is a tradeoff in the factor mix between labor and capital. We must distinguish among investment outlets and find policies to guide investment into more labor-using ones.
4. Using labor for capital means recovering and replacing capital more often, which increases aggregate demand for labor, as well as the flow of consumable goods and services as long as there is surplus labor to employ. It increases the flow of gross investment associated with any given kind of capital.

Based on that analysis, we can then see how to invest so as to put capital where the jobs are, to invest so that the “job-creating efficiency,” if you will, of capital and land is higher—not a maximum, but an optimum, where idleness is only voluntary and the amount of capital suffices that people save voluntarily. We can also discuss which tax policies would serve to remove the present bias.

A. Factor Mix and Factor Prices

We can make more jobs by using more workers (W) per unit of land (L) and capital (K). Some employers already mix enough workers with their land and capital to employ everyone if only most other employers were moved to act a little more like them. What needs doing is already being done, it just needs to be done more. Of course, we do not propose to proselytize employers with this information or to use regulations to force them to hire more workers. We will identify the kinds of operations that use more labor in the mix, that is, a high

$W/(L + K)$. Then we can see how to stop penalizing them, and how to get more like them, by changing the incentives created by different taxes and other institutions.

The goal is not to make work for its own sake. Combining labor with land and capital more efficiently not only creates more jobs; it also creates more goods and services. One can produce much more value from the same land by applying more labor, and without wasting labor.

1. Historical Observations About Land “Engrossment”

A good starting point is the observation by Adam Smith that the value of land and other resources depends on how actively the owners use it. In the following passage, Smith ([1776] 1937: 538–540) notes that land is the source of prosperity but that it fails to fulfill that purpose if the law permits concentrated ownership—what he calls “engrossment”:

In plenty of good land the English colonies of North America . . . are . . . inferior to those of the Spaniards and Portuguese. . . . But the political institutions of the English colonies have been more favorable to the improvement and cultivation of this land. . . . First, the engrossing of uncultivated land . . . has been more restrained in the English colonies. . . . The plenty and cheapness of good land . . . are the principal causes of the rapid prosperity of new colonies. The engrossing of land, in effect, destroys this plenty and cheapness. The engrossing of uncultivated land, besides, is the greatest obstruction to its improvement.

Henry George gave this theme center stage in his philosophy, attributing unemployment to speculative withholding of some land from use. Labor needed access to land. It had access to some lands, but these were oases in the speculative desert. Later commentators have mistakenly imagined that George was talking about farmland, when in fact his explicit emphasis was on urban land. The land today that employs most people is in cities, and a major source of underemployment lies in holding a surprisingly large portion of urban sites idle or in suboptimal uses. Anywhere from 10 percent to 40 percent of buildable lots in cities are unused or occupied by derelict buildings or low-value uses, such as parking lots. Urban sprawl, “scatteration,” or “leapfrog development” leads to extremely different intensities of use on neighboring lands. Smith and George wrote in black and

white contrasts. More generally, land is fallow, “engrossed,” or “held in speculation” by degrees, and in this sense sprawl and scatter are the universal condition.

2. Tax Biases Affecting Land and Capital Combinations

Economists seem well aware that factors blend and mix in a range of ratios. They make use of the principle of variable proportions. They note the contrast among nations and regions resulting from different relative prices: more labor per log in European than Canadian saw-mills; more labor per acre on Japanese than Argentine farms; more capital per acre-foot of water in the citrus groves of arid Tulare County, California, than the rice fields of the Sacramento Valley. They have noted that larger companies and governments tend to favor more capital-using techniques.

They have been less good about attributing some of these contrasts to institutional bias, specifically to biases introduced by the tax system. There is a strong positive relationship between belief in tradeoffs and devotion to the price system. Too often contrasts of factor mix are adduced to rationalize the price system, when in fact they display the bias of institutions like taxation. Perhaps that is the result of specialization that leads economists to ignore important concepts and nuances in other subdisciplines. Industrial economists examine factor combinations, but they have little interest in the way they are influenced by tax policy. Public finance economists pay attention to different types of taxes, but they tend to treat capital as homogeneous and ignore different factor combinations. Those who work within the subdiscipline of macroeconomics ignore most variations in both factor combinations and taxes because their aggregate models abstract from those differences. The result is that specialists have completely ignored the possibility of a causal nexus between tax policies, factor combinations, and the periodic malfunctioning of the macroeconomy. At present those categories are examined separately, and it is our task to bring them together to show their connections.

In macroeconomic models, labor is treated almost as the only cost, so wage cuts might only lead to “vicious downward spirals,” and wage boosts can only be shifted forward in “vicious inflationary spirals.”⁸ Since factor price flexibility up or down is vicious, the models (such

as the Harrod-Domar model or the Solow model) assume either constant or growing capital intensity (a fixed or rising amount of capital per worker ratio).⁹ Under those circumstances, the only way to make jobs is by “growth”—by adding to the stock of capital—and in the more pessimistic models, even that may not be adequate to prevent permanent stagnation. There is no thought of making jobs simply by enriching the mix with more labor. That would be retrogressive, lowering “productivity,” or reactionary and unmentionable. There is, if anything, a sense of predestination that forces us to use ever more capital per worker.

3. Counterproductive Expansionism

We are left with a theory of compulsive growth. Worse, when it comes to intensifying the use of land, it often turns out to be land occupied by other people. We justified the conquest of North America on the grounds that Europeans used the land more productively than the native inhabitants. Alvin Hansen (1939) integrated Keynesian fatalism with traditional Americana by attributing stagnation in part to the closing of the frontier. Since recessions followed the sudden oil price hikes of the 1970s, many economists seize on our loss of cheap foreign oil and other primary products as the killer of jobs.

In fact, expansionism in pursuit of employment is counterproductive, whether it appears as the pursuit of new land, new energy sources, or new military spending (based on the idea that World War II saved us from the 1930s depression). In the past, the frontier was a great sink of capital. Overinvestment in canals and railroads on the frontier was a major source of the depressions that afflicted the nation repeatedly in the 19th century. Frontier expansionism neglects the inner frontier, the intensive use of labor on the land we already have.

The energy industry has also absorbed massive amounts of subsidized capital, in terms of production, consumption, and militarism. Energy-driven jingoism has at times been justified as a means of maintaining full employment (particularly after the Volcker recession of 1982), but more energy does not create new jobs. In fact, energy serves as a substitute for labor more often than as a complement. Consider the fact that cheap energy powers the farm machinery that drove labor off the farms in the past. In that case, energy combined

with capital and land, not labor. More generally, capital, labor, and energy are substitutes for each other.¹⁰ A significant rise in energy prices in the future (which is likely, after recovering from the current downturn) will help achieve full employment, if the market is allowed to work. However, if we tax labor to subsidize energy production (such as the current subsidy to corn farmers for biofuel), then we shall have cheap fuel and unemployed workers. Berndt and Wood (1979), in a comprehensive study of American industry, found that energy use is highly related to capital use, not labor.¹¹ Note that the “inner frontier” of energy does not refer mainly to producing more primary energy domestically, but to economizing on energy by substituting labor for energy at the margin.

By comparison with the many studies of energy efficiency, capital intensity, and the substitution of labor and capital for energy, comparatively little research has been conducted on how the inefficient use of land affects the economy. On the face of it, we have intensified the use of land through urbanization. Yet instead of urbanizing people, we have suburbanized cities. As housing has shifted from row houses to lots of one-sixth of an acre, to one-quarter acre, to one-half acre, and even larger, and as commerce has shifted from urban centers to suburban strip malls, we have been reducing the density of cities by about 50 percent every 40 years. Instead of intensifying land use, we have made it more extensive, sinking enormous capital into new roads, pipes, streetlights, and light-rail systems. We have extended police and fire services over an ever-expanding area. Providing urban water unleashes municipal hydro-imperialism, as cities range far away to capture remote waters rather than clean and develop nearby sources.

Thus American urbanization replicates the continental frontier and global expansion. As we expand urban boundaries, we use up our capital prodigally. It would be a mistake, then, to think that making jobs by applying more labor to land, the policy advanced here, would entail more conversion of farm to city land, more new towns, shopping centers, industrial parks, and the like. Territorial expansion generally raises the required complement of land per worker. It spreads people out over a larger geographic area. That might have worked well when people lived in self-sufficient feudal domains, but in an integrated modern economy of specialization and exchange,

it raises the cost of water supply, road building, and of every other economic transaction without any corresponding benefit. The net effect of shifting activity onto marginal sites is to lower wages and reduce returns to capital. Investment in the extension of capital and energy over larger expanses of land is the clearest form of anti-investment and a major cause of economic downturns.

4. Varying Intensities of Land Use: Tax Biases and Employment Effects

Here follow some data to illustrate the varying intensity of the economic use of land. The data refer to neighboring lands, generally, of comparable quality and in the same markets.

The first data are from California farming. In the San Joaquin Valley, east side, land is versatile among many competing uses. Table 2 is a crop report gathered by the U.S. Bureau of Reclamation from its Friant-Kern Canal Service Area. Not all the land is versatile among all the options, but a close study of the area has shown that the margins between the uses are ragged (Gaffney 1961; Althouse 1942).

These data are five decades old, so the absolute dollar values of the various crops have changed, but the ratios are what we are interested in, and they have not changed. The reader is also advised that we have chosen an agricultural example merely for convenience because the relationship between land and production is more obvious. But land is also needed to make bicycles or jet engines or to provide hairdressing services. Farming is not in a separate category from industrial or service jobs. The same principles regarding the application of factors of production apply to all types of enterprise.

What we are looking for here is evidence of how the intensity of land use is affected not only by market conditions but also by tax policies that affect employment, not by design, but by accident. To the extent that the market determines land use, each unit of land will maximize rents (a more exact term than "profits") for its owner if inputs are added, as long as they add more value than cost. Taxes that distort land use intensities create the conditions that can culminate in macroeconomic problems. Faulty tax incentives filter through every decision in an economy. They lead to land use decisions by every operation from the humblest farmer or small business owner to the

Table 2
Crop Production, Friant-Kern Canal Service Area

Crop	Acres	Value per Acre (\$)
Berries (all kinds)	80	1,215.6
Beans (fresh market)	75	975.3
Oranges and tangerines	24,952	915.5
Beans (processing)	27	900.0
Tomatoes (fresh market)	1,343	881.2
Prunes and plums	3,288	674.0
Peaches	6,371	644.4
Cantaloupes, etc.	507	547.0
Grapes, table	43,795	545.2
Onions, dry	86	495.7
Asparagus	1,383	418.7
Potatoes, early	12,711	366.0
Cotton, lint (upland)	108,928	352.8
Walnuts	1,374	338.1
Lettuce	423	336.5
Olives	7,172	327.5
Corn, sweet (fresh market)	254	205.9
Rice	907	167.7
Alfalfa	1,279	151.8
Alfalfa hay	63,460	144.1
Beans, dry and edible	4,293	107.1
Corn	10,490	96.7
Wheat	3,176	87.9
Irrigated pasture	17,388	77.7
Sorghums	17,279	74.8
Barley	15,696	51.1

Source: U.S. Bureau of Reclamation, Sacramento Office (1958). Minor crops omitted.

largest corporation, and those micro-level decisions add up to bank failures and macro-level instability and unemployment.

What do the data about the yields of different types of crop tell us? Land yields a little or a lot of value, depending on what you mix

with it. According to the table, 80 acres of berries will yield roughly the same gross revenue as 300 acres of lettuce or 1,000 acres of wheat or corn. If gross revenue were all that mattered, everyone would plant berries. But costs are also higher for berries because planting, tending, and harvesting them requires much more labor than the other options.

Almost every parcel of land has several options, and many of them are choices between the highest and the lowest gross. Let us assume that a farmer can gross \$15 by grazing animals or \$1,500 by growing tomatoes. Labor's share of gross rises with intensity, defined here simply as nonland inputs divided by output. (To simplify the discussion here, we are combining labor and capital inputs into a single sum.)¹² For grazing, this is on the order of $\$6/\$15 = 40$ percent. For tomatoes, it is more like $\$1,400/\$1,500 = 93.3$ percent.¹³ The remaining amount (\$9 for the land used for grazing, and \$100 for the land used for tomatoes) is the return to land, or rent.

Because the land growing tomatoes has a small (6.7 percent) ratio of rent to gross revenue (or "profit margin"), this production process is highly leveraged. That is true of any high-input, high-yield operation. Being leveraged means it is highly sensitive to small changes in input costs, such as wage rates. If those costs rise by seven percentage points, the economic rent is wiped out; a drop of seven percentage points more than doubles the rent. By contrast, the land used for grazing is not highly leveraged, which means it is also not sensitive to wage or tax changes. The same wage change that would bankrupt the tomato farmer would only imperceptibly change the returns to land from grazing.

Because of leveraging, the elasticity of demand for labor on land growing high-yield crops is quite high. A small change in the price of labor leads to a large change in the demand for labor. On the one hand, a slight drop of labor costs will encourage many farmers to shift land from low-yield crops, such as wheat or pasture, to high-yield crops, such as fruits and vegetables. On the other hand, the prospect of an increase in the payroll tax will have the opposite effect. It will economically sterilize land that has the potential to yield a lot of value per acre and turn it into land used only for growing relatively low-value crops.

The high-grossing crops use more labor per acre not just in the fields but also in the packing houses, the railroads, the stores, and the kitchens. A \$900 tomato crop will use more labor at every step to the consumer than a \$15 weight gain on a calf, and will use it sooner, and much more often. Thus a higher use of labor in the field increases demand for labor beyond the field. Going in the other direction—from store to farm—any policy that reduces labor costs in food wholesaling, retailing, and processing (either technical change or a cut in wage taxes) will lower the price to the consumer and increase the quantity demanded from the farmer. If that chain of events were to raise field prices by, say, 7 percent, that would (in our example) double land returns from tomatoes and increase demand for labor on the farm.

The scope for this kind of change is manifest in the fact that most of California's farm output comes from a small fraction of its good farmland, that which is used intensively. Of the 9.2 million acres of irrigable land in California, approximately 24 percent grows high-intensity crops.¹⁴ The remaining 76 percent grows mostly low-intensity crops, using less labor to yield fewer dollars' worth of barley, alfalfa, forage pasture, hay, sorghum, safflower, rice, or cotton.

In irrigated farming, water is an indirect land input, since a water right is the right to the water yield of a vast watershed. One might then think the tomatoes really use a lot of land in the form of irrigation water. But in fact, the high-grossing crops such as tomatoes, citrus, peaches, and berries are modest users of water. Pasture, alfalfa, and rice are thirsty crops, and they yield only \$50–\$200 per acre, not one-tenth of the high yielders. Marc Reisner (1993) and other critics of the massive water transfers in the American West correctly point out the absurdity of growing water-intensive crops in the middle of a desert. What those critics have failed to grasp is that the misallocation of water (and land) is a direct result of their tax treatment.

Let us summarize what we have discovered thus far. High marginal tax rates on labor—from 15 percent to 50 percent of wages—discourage highly leveraged uses of farmland that rely heavily on labor (e.g., growing strawberries or broccoli). (The same principle applies to urban land, but we are concentrating for the moment on farming.) Wage taxes therefore cause land to be shifted toward capital-intensive uses, such as cattle grazing or mechanized farming,

or toward water-intensive uses, such as rice or alfalfa. The highest-value uses of land cannot compete, at the margin, with uses that involve a high capital/labor ratio, particularly uses that add capital with a slow payout period. Low-turnover capital requires little labor. Low tax rates on land, and no taxes on water rights, exacerbate these biases. Because land is underutilized (used for purposes with low value-added), farmers and businesses bid up the value of marginal land and expand into territory that would remain untouched except for the biases created by the tax system. A society will keep expanding its use of resources and capital in order to achieve a given level of value-added. Economic overexpansion and imperialism are symptoms of the failure to get the value needed from the use of a more limited range of resources.

Farmland use in general varies so much from farm to farm that “farm sprawl” and “horticultural sprawl” are as common as urban sprawl. But this reminds us that all our cities are dominated by sprawl, which is essentially a condition of extremely different intensities on adjacent lands.

Different mixes of land with nonland inputs are not the exception but the rule.

5. Concentrated Land Ownership and Diminishing Labor Intensity

It does not surprise tax economists, of course, to learn about differences of factor proportions, for that is at the heart of the problem of tax enclaves. As everyone knows, localities compete to attract capital-using plants and to repel labor-using ones, and they find large differences among them. Factor mix also tends to change with size of business and wealth of individuals. As a broad statistical truth, the application of labor to property tends to be regressive. Larger farms and industrial plants use less labor per unit of property value than smaller operations. The U.S. Census of Agriculture ranks farms by value of gross sales. In 1950, “Class I” farms, those grossing \$25,000 or more, had 22 percent of the land in farms but 7 percent of the farm labor (U.S. Census Bureau 1953: 51). The ratios of capital to worker and land to worker both increased with the size of the farm. The small producers, of course, made the figures balance by applying more labor per acre.

A large number of studies in many countries have demonstrated statistically that labor inputs diminish with the size of farms. Berry and Cline (1979: Ch. 4) document the decrease in labor per acre in developing countries and the lower output per acre on large farms than on smaller ones. As farm size increases, land, water, and capital displace labor. In addition, the economic intensity of land use diminishes. That is to say, value added per acre declines as farm size increases. To the extent that capital has substituted for labor because of increases in technical efficiency, that has been a social benefit. However, to the extent that taxes have distorted decisions about the proper mix of land, labor, and capital, the displacement of labor has been social folly that results in unemployment and financial instability.

Turning to "industrial" corporations, the regressive use of labor on property may be inferred from data in *Fortune* magazine's yearly report on the largest 500 corporations.¹⁵ The larger the corporation, the higher the proportion of its income comes from land and capital rather than from labor. I tested the thesis by ranking corporations by "net worth" or invested capital, and calculating profits (after taxes) per employee. Table 3 shows the broad results. Profits per employee are 11 times greater (3,291/297) for the largest firms than for the smallest firms.

The choice of profits per employee to test the case is based on the premise that profits are the best index of the real assets of a firm. In fact, if the larger firms use their property less intensively (as this and other evidence suggests), then their realized profits as an index understate the assets of larger firms compared to smaller ones. Larger

Table 3
Profits per Employee, Large and Small Industrial Firms,
Ranked by Net Worth

Group	Net Worth (\$000,000)	Profit After Taxes (\$000,000)	Employees (000)	Profits per Employee (\$)
Top 10	40,090	5,470.0	1,662.0	3,291
All 500	133,660	14,839.0	9,966.0	1,489
Lowest 10	116	8.8	29.7	297

Source: Calculated from data in the *Fortune Directory* (1964).

firms also tend to be more highly leveraged with debt than smaller ones, since the large ones have better access to credit. For that reason, profits will underestimate the total assets of large firms more than small ones. Thus, the biases reinforce the conclusion that small firms combine more labor with their assets than large firms.

6. Expansionism: Civilian and Military

If there is something about size of business that discourages labor use, it would follow that mergers tend to result in reduced jobs on given assets. Jon Udell (1969) found just that in his study of mergers in Wisconsin. A wealth of fragmentary evidence suggests that this finding would be duplicated elsewhere.

The largest organization is government. The public sector is the most property-using of all. It has a reputation for wasting labor, and in some cases conspicuously does. But it pays the market for labor, while the interest rate on money it borrows is well below the market rate. As to land, it still holds much more than anyone, tax-free and unmortgaged, with little internal pressure or shadow price to reflect the foregone gains.

The military, for example, holds 20 percent of San Francisco and Washington, D.C. virtually idle. The annual value of this kind of lavish land input does not appear in the budget. The national forests use much more capital (as timber) per man employed than do private ones, especially small private ones, a fact that Forest Service doctrine makes a virtue. Richard Muth (1973) has concluded that the outstanding distinguishing trait of public housing is its higher capital intensity. Civil engineers, generally working for governments, have become notorious for producing white elephants by treating capital—not labor—as a free good, and for overstating future benefits next to present costs by using low interest rates (U.S. Congress Joint Economic Committee, Subcommittee on Economy in Government 1969). One can justify any project using a low enough interest rate and ignoring land costs. In the limiting case, using a zero rate of interest, the present value of future rents in perpetuity equals infinity.

Private utilities are capital-using, of course. But governments supply the most capital-using utilities, like water and sewer, which are increasingly costly because of urban sprawl. Governments are always

called on to put up social front money, to push back and invade frontiers, territorial and otherwise, where the payoff is too slow for private capital.

Since the 1950s, a number of studies have analyzed the costs and benefits of peripheral expansion of public services, particularly water and sewer lines (Isard and Coughlin 1957; Mace 1961; Downing 1969; Real Estate Research Corporation 1974). Most such studies were motivated by growth controversies. They framed the question of growth in terms of whether new developments generate enough tax revenue to pay for themselves, regardless of location and timing. Our concerns here are location and timing. Even if developers now pay for the infrastructure costs within new developments, the taxpayers of older areas characteristically finance the expansion of treatment facilities, trunk lines, and other capital costs of development of new areas for years, sometimes decades, before the newly serviced lands return enough taxes to pull their weight (Gaffney 1977). It is another long span of years before they return the advance of capital by generating fiscal surpluses above their share of public costs. Such is the lag of private building behind public works that the public capital is sunk for years before payout.

A perfectly analogous case that has received detailed study is the lag of private behind public capital in irrigation projects. The classic is Weeks and West (1927). Public capital flowed into irrigation 10 to 30 years ahead of complementary private capital, leaving the public to finance dead capital in the meantime. But that was before the great explosion of state and federal financing, and later problems have grown larger. Factor mix also changes over time. We often read of declining capital/output ratios, but these do not show declining capital intensiveness because labor/output ratios are declining faster. (As noted earlier, capital intensity has more than quadrupled since 1950, not including the public sector, where the ratio has undoubtedly grown more quickly.)

7. Longevity of Capital and the Displacement of Labor

Marxists and other technological determinists have averred that changing techniques are inevitably more capital-using, but most economists today would recognize that the course of inventions and

their application depend on relative costs. Technology evolves in response to costs, rather than being an autonomous mover of history. We are left with institutional bias as the likely cause of the failure of the economy to soak up surplus labor.

The source of this bias is not far to seek. To enrich the mix with labor, we would need to encourage the things that humble folk do, and take the fun out of many things that the rich and mighty do. It is not impossible, but it does call for a more effective philosophy than the poor and needy have embraced in modern macroeconomics.

Let us underscore what the facts just cited imply about the elasticity of demand for labor. On some lands and in some firms, labor is 90 percent of costs. Property gets 10 percent. The return to property is here highly leveraged by changes in the price of workers. An 11 percent drop to labor doubles the rate of return to land and capital; an 11 percent rise in wage costs wipes out those uses of land. At the other extreme, where labor is 10 percent of costs, halving or doubling the wage rate raises or lowers property income by only 5.5 percent.

All of the above may seem only marginally relevant to some readers because of their beliefs that (1) land is a minor input relative to capital and (2) labor produces capital anyway. As to the first belief, I have marshaled evidence against it elsewhere (Gaffney 1969, 2009). According to the second belief, industry employs labor to produce the capital, and such investment is the motor of the economic machine.¹⁶ What then is the labor content of capital?

Let us say farm machines displace farm labor. Looking upstream, we see labor helping produce the machines. Is capital displacing labor, or is it merely labor stored in machines displacing onsite labor? We know the machine needs fuel, and fuel is capital-intensive to produce, but that does not tell us much until we know what “capital-intensive” means, for refineries, too, are produced by labor. So let us just focus on the farm machine. Keeping it simple, we ignore marketing costs between factory and farm.

Let us say a new super-harvester displaces farm labor. Looking upstream, we see labor helping produce the harvester in Peoria. Is capital displacing labor, or is labor stored in harvesters displacing onsite labor, or some of each?

To answer, let us follow one harvester through its life. It costs \$100,000. The buyer lacks that kind of cash, so he finances it at 7 percent over 10 years, its expected life. To avoid any early cash drain he agrees to make a “balloon” payment after 10 years. The lender, to get her 7 percent, must require \$197,000 at that time, about double what she advanced ($1.07^{10} = 1.97$). The harvester’s service flow over life must be roughly double the initial cost. Even if the labor content of the new harvester were 100 percent, which of course it is not, and even if the fuel used were entirely a labor product, which of course it is not, wages as a fraction of the harvester’s service flow are just 50 percent.

More commonly, of course, borrowers pay on the installment plan. They repay the lender bit by bit, year by year, together with interest on the unpaid balance. This holds down interest charges, because the lender recovers most of her capital sooner. Interest does not fall, however, to anywhere near zero. The level annual payment that will return lenders’ capital with interest over 10 years is the capital recovery factor.¹⁷ At 7 percent and 10 years, the factor is 0.142, or \$14,238 annually for the loan of \$100,000. Over 10 years, that comes to \$142,380, or 42 percent more than the original cost. The harvester, in equilibrium, must yield its owner that much more than its labor cost. Wages as a fraction of total service flow are \$100,000/\$142,000, or 70 percent.

The 70 percent figure is based on a 10-year total life (or “carcass life”) of the harvester. In the tenth year the harvester is not much more than a hollow shell, economically speaking. The capital is actually committed only a little more than half that time, on the average, because the lender recovers part of it each year and reinvests the income in new projects. So the payback time is really only about six years, to lower wages to 70 percent of the product, and raise interest to 30 percent of it.

Either way, capital contributes a big share of the service flow, and claims an equally big share of the harvest. This is basically because the capital is tied up a long time before payback. With shorter payback times, capital’s share is less. For example, if the investor recovers capital at the end of one year, interest adds only 7 percent to the total cost, and the ratio of wages to total product is $1/1.07$, or 93.46 percent.

On the other hand, if the carcass life is five years, the wage share is 82 percent; if 10 years, then 70 percent (as we have seen). If the carcass life is 20 years, then the wage share is 53 percent; if 40 years, like a cheap house, 33 percent; if 80 years, like a mid-rise office building, 18 percent.¹⁸ Throughout the economy, the share of labor in the flow of service from capital falls as the life of capital lengthens.

Table 4 shows the same calculation for buildings or equipment with a life of 5 to 80 years, with an interest rate of 8 percent. The comparison with 7 percent (in the preceding paragraph) indicates that the wage share goes down slightly as the interest rate rises.

We have slurred over the land input so far, but it is easy to deal with now. Labor is applied less frequently to land where labor is embodied in capital of long life, so the share of land rises relative to labor with life of capital.¹⁹

Figure 1 shows the relationship among land, labor, and capital graphically. The graph presupposes that an even flow of investment is

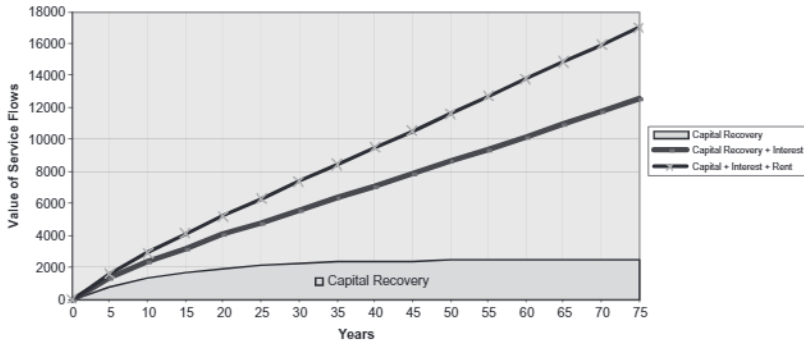
Table 4
Relative Shares of Construction Wages and Interest in
Cumulative Cash Flows from Capital Goods of Varying Lives,
Using Interest Rate of 8 Percent

Life of Capital	Investment Cost Divided by Annual Cash Flow	Wage Share of Cumulative Cash Flow (B/A)	Interest Share of Cumulative Cash Flow Interest (1 - C)
A	B	C	D
5	3.99	80%	20%
10	6.71	67%	33%
20	9.82	49%	51%
40	11.92	30%	70%
80	12.47	16%	84%

In Column B, investment cost means the initial cost of the capital equipment or building. The annual cash flow is the annual payment required if even payments are made over the life of the loan. So, if a building costs \$5 million and lasts for 40 years, the annual payment would be about \$419,000. If there were no interest, the loan would be paid in 11.92 years, but with 8 percent interest, the borrower repays \$5 million every 11.92 years.

Figure 1

Components of Service Flows of Capital Investment



made each year in an equivalent unit of capital equipment (such as one harvester per year in the above example). Thus, the graph represents service flows from all units in service over the entire life cycle of the equipment. Each curve represents respectively the shares of cumulative service attributable to *capital* goods (buildings and equipment), *interest* as the value of time, and *rent* as the value of location. In the figure, the horizontal (X) axis represents the life (in years) of a unit of capital equipment. The distance between the X-axis and the lowest curve is the maximum amount of service flow that can be attributed to labor, on the exaggerated assumption that 100 percent of the cost of producing a piece of capital equipment comes from labor. The distance between the lowest curve and the heavy line is the amount of service flow dedicated to interest payments. The distance between the heavy line and the highest line represents the amount of service flow that covers ground rent.

Ignoring ground rent for the moment, the graph shows that most of the service flow of capital can be attributed to labor if the carcass life is less than 20 years. For capital with a short life, the shaded area is larger than the triangular area above the shaded area and below the dark line. For capital that endures longer than 20 years, the longer its life, the more of service flow pays interest rather than labor.

The triangular region above the heavy line but below the thinner line represents the service flow for rent. The service flow for one year

is the site rent (the value of the location of the building or where the capital equipment is used). Better locations add greater value, and the best use of each site is the one that maximizes the rent or economic surplus. Thus, if sites are being used optimally, the service flow from rent will be greater for investments of longer duration. The area of the topmost triangle in the diagram, representing the service flow added by rent, is annual rent times the number of years a site is occupied. Even though the wedge represented by rent rises with the durability of the capital on the site, it does not increase as rapidly as the service flow from interest. This leaves us with two important conclusions: (1) the share of service flow created by land rises relative to labor with the increasing life of capital; and (2) the share of service flow created by land falls relative to interest with the increasing life of capital.

8. Growing and Flowing Capital

There are two kinds of capital: growing capital, which is storing up value, and flowing capital, which is releasing it in the form of service. The one is growing in value, the other shrinking as its value flows out into goods and services.

The above all refers to the latter, flowing kind of capital, which shrinks (depreciates) with time. The same relationship between long life and labor's share also obtains with growing capital, only more so. We follow \$1 through the life of a tree it is invested in to plant. The tree is cut after 60 years and sold on the stump for \$58 per dollar of initial labor, for a rate of return of 7 percent per year (because $1.07^{60} = 58$). So labor's share is $1/58$, or 1.7 percent. I omit any table or graph because growth at compound interest is so familiar. Labor's share falls steeply as time passes.

For a fuller picture we would add the cost of logging, which is mostly labor, and that may equal the stumpage in value. This would raise the wage share, but it remains true that the longer the rotation age, the less often these wages are paid.

The share of labor in growing capital is less than for flowing capital of the same carcass life. The labor in flowing capital starts to flow out early on, but that in growing capital is locked in until the product is ripe, and joined by yet more capital that is not produced by labor at all but by land and other capital, the invisible inputs.

With growing as with flowing capital, the basic principle is unaffected by having a going concern. If we have a normalized forest of 60 cells (loggers call them “chances”), and cut and regenerate one chance each year, then we must keep 59 chances in inventory drawing interest for every one that we pay workers on. As before, the function relating labor’s share to life is the same, whether we look at one chance of trees over life or at one normalized forest over one year of its life—which is not surprising, considering that the normalized forest is a cross-section of the whole life of one chance of trees, there being one chance of every age. Knut Wicksell (1934: 176 ff.) demonstrated this long ago in his *Lectures*. His example was wine, so wags call it “the grape juice model,” but the ideas are the same. As before, there is less labor per acre when labor is used less often.

The crucial point is that there is less labor content in the machine that lasts longer. In general, the share of labor in the flow of service from capital decreases as the life of capital lengthens. Once again, we return to the central point of this essay: capital with a long life displaces labor, because it turns over and is replaced slowly. Capital with a short life enhances the demand for labor. In the extreme, direct services like haircuts are almost all labor, except for a small element of rent on the premises.

An important corollary is that an investment in enduring capital also increases the share of land in the value of production. Labor is applied less frequently to land where labor is embodied in capital of long life, so the share of land rises relative to labor.

Here are some familiar, recognizable traits of capital-using objects and enterprises, a sort of Field Guide to Capital Intensity (i.e., to capital that endures and does not turn over quickly):

1. The payout is deferred. The benefits are strung out, so that the object has to yield a large surplus over investment to cover interest. This surplus is the value added by capital, the Austrian “agio.”
2. The cash flow, when it comes, is largely interest income. Recovery and depreciation are a minor share of cash flow. By the same token, if the object is financed, most of the periodic payments are interest for several years. The installment needed to retire the

debt with interest is not much higher than simple interest on the original principal.

3. Demand is very sensitive to changes in interest rates, as with housing and all durable capital. Demand is also sensitive to the property tax, since it functions much like interest in raising the cost of investments in durable capital. Because a large portion of each installment is interest, a 10 percent increase in the interest rate (say, from 5 percent to 5.5 percent), imposes an 8 percent cost increase in a 40-year investment and a 10 percent increase in an 80-year investment.
4. Only a small share of the objects are normally replaced each year. The slow turnover of the buildings or equipment means less demand for labor.
5. A large share of the objects suffer obsolescence at any given time. For example, a significant part of the housing stock in many cities has outlived its useful life. High interest rates and a high property tax on buildings prolongs the life of housing by discouraging new construction, which bears the major brunt of the tax on buildings.
6. If the objects are attached to a site, as the most durable ones are, labor is applied onsite in a bulge, a one-shot payroll. There is no fund quickly recovered to reinvest to sustain the payroll.
7. The services stored up do not flow through to consumers for a long time, so production creates incomes without yielding up the goods to match them. This is true of both growing capital (like trees or cattle), and flowing capital (like buildings or trucks).
8. The fund-to-flow ratio is high: a large stock per unit volume of sales.
9. Finally, it is fair to say that the owners and other beneficiaries of these objects often demand relief from the test of competitive interest rates, a test they cannot pass. They also demand, and often get, special relief from property taxes.

For any purpose for which land and capital are used, there is a full range of technical options. The choice depends on relative input costs, that is, the cost of labor versus the rate of interest. High labor costs

(including labor taxes) screen out labor-using investments, and high interest rates screen out capital-using investments. Capital that matures or turns over in a short period is highly labor-elastic (responsive to changes in the price of labor). Long-lived capital is highly interest-elastic. High annual payments for land (either in the form of interest or taxes) have the same effect as high interest rates on capital; they discourage durable capital and promote forms of capital that turn over rapidly.

If wages are high, firms invest more in capital, specifically in durable capital. Where labor is 90 percent of costs, a 1 percent increase in labor cost reduces property income by 9 percent.²⁰ Rising labor costs, either from a wage increase or an increase in a tax on labor, induce investors to conserve on wages and spend more on interest. High wages and other labor costs screen out short-term, labor-using capital; high labor costs promote long-term investments in durable capital.

If interest rates are high and wages low, the reverse is true. The shorter maturity gains an advantage or premium over the longer one. Long-term capital investments (such as buying a house or building a dam) are screened out by high interest rates because most of the cost of long maturities is interest. They are prodigal of capital, so naturally a high price of capital screens them out. These are the adjustments made routinely as a result of market signals.

9. Activating Capital by Encouraging Faster Turnover

The ready answer to our current crisis of capital shortage (and to the more general problem of avoiding liquidity crises) is to invest in shorter maturities, deliver the final goods more quickly to consumers, recover and reinvest the capital more quickly in payrolls to use the whole labor force. That is my thesis in a nutshell.

Problems arise when the government adopts demand-management solutions to a credit shortage. That is particularly true if those solutions include investment in "infrastructure," which necessarily means capital with long maturities (roads, transit systems, dams, etc.). Such projects lock capital up in projects that will pay back slowly, employ few people per dollar of investment in construction, and even fewer in capital turnover.

The key to full employment, then, is raising the labor-combining valence of capital by turning it over faster. Active capital moves labor, while torpid capital merely occupies land and often displaces more labor than it employs.

The key to activating capital in this way is to let labor costs fall and the cost of capital rise. Conservative economists have long advocated something like that, by putting a lid on wages. Those of more analytical bent have stressed the “Ricardo effect,” the substitution of cheaper labor for capital. Labor, of course, has resisted that message. They have all, however, failed to observe that we can lower wage *costs* without lowering wage *rates*, or take-home pay. This can be done by abating institutional biases like payroll taxes, withholding taxes, and sticking employers per se with social overhead costs like pensions, workers’ compensation, medical insurance, etc. Likewise, we can raise capital costs without raising interest rates by removing income tax loopholes for capital and taxing property more heavily. Thus one can advocate lowering wage costs and raising capital costs without lining up with the demons in the House of Labor. But neither does this preclude one from faulting excessive wage demands, even as the conservatives do. In short, this is not a gut issue pitting “liberals” against “conservatives” in tired routine combat rituals, but a new issue calling for some celebration and promising a way out of old dead ends.

The capital stock of an economy is a great revolving fund. Each time a unit of it cycles, it combines with workers. To combine the whole great fund with surplus labor, we need only turn the whole faster. This will deliver ripe goods to consumers at a faster rate: Growing capital will spend less time growing before harvest, and flowing capital will spend less time frozen in cold storage before thawing and flowing. Reinvestment of the recovered capital will increase incomes with which to buy the augmented flow of goods and services.

Here we collide with one of the firmest biases in our cultural impedimenta, the bias against rapid replacement. To many people that connotes waste, shoddiness, flimsiness, speculation, demolition of treasured antiquities, planned obsolescence, and tacky-tacky. That those are indeed only connotations and perversions of the principle, not the essence, does not placate some people. Long life to them connotes reliability, stability, soundness, trustworthiness, and old-

fashioned goodness. These values lie deep in the cultural subconscious and will not yield easily. They are indeed part of what sustains the institutional bias that causes unemployment and inflation.

An economist cannot plead against them so well as point to the high price of indulging them: inflation and unemployment, as well as neglecting the positive values of flexibility, adaptability, early embodiment of technological advance, reduced capital requirements and easier entry, replacement of obsolete equipment, stimulus to creativity, mobility, and evolution.

It may help some to note that the "life" of flowing capital, as the term applies here, is not carcass life but service life. The idea is not to shorten carcass life, but to speed the delivery of value to consumers, and with it the recovery of capital invested. If the carcass survives, well and good; it is a bonus.

The purpose in demolishing an old carcass of, say, a house, is to recycle the site it preempts. This offends the preservationist in many people, but two observations are in order.

First, demolishing old buildings and replacing them with new is a way of preserving more old capital than is demolished, just like replacing a car's dead battery, or pulling a sick tooth. Surgical demolition is preservation, in the larger sense. Replace the sick house and preserve the neighborhood; preserve the neighborhood and preserve the city, with all its capital infrastructure and all its valuable land. In the past year, foreclosures of houses with subprime mortgages have depressed the value of nearby property, causing a spate of further foreclosures. This "neighborhood effect" reveals why there is a high social cost in preserving capital beyond its economic life.

Second, the best way to renew many sites is not to demolish but to rehabilitate. In that way, the policies advanced herein are in tune with Jane Jacobs's (1961) image of the good city life. Rehabilitation is labor-using, compared to new construction. So is operating the older buildings: maintenance and operation of buildings eats up an ever-larger share of rent as they age. Shelter from old buildings is a product of labor more than of capital.

Thus, we are led to a second paradox. The first paradox, which we have discussed above, is that reducing wage costs (by cutting taxes on wages) will increase wage rates by increasing the turnover of capital

that combines with labor. The second paradox is that more rapid capital turnover will prolong the life of buildings. Our present taxes are biased in favor of durable capital over labor. One might assume that a capital-intensive bias would cause buildings to last longer, but that is not the case. Ironically, it promotes premature abandonment of old buildings, which is why entire sections of some cities are slums. Reducing wage costs and investing in capital of shorter service life favors extending the carcass life of old capital by patching it up with investments of shorter life than a wholly new structure would have, and by using more labor to operate it. Effective neighborhood reconstruction is achieved not by mass demolition and new construction but by continuous upkeep.

We have shown now that labor benefits when both land and capital are frequently recycled, rehabilitated, upgraded, and reused. That depends on how actively the owner combines those factors with labor. We have shown that the elasticity of demand for labor is high for combining with both land and capital, when the factor mixture is rich on labor. This is owing to the leverage that labor costs exert over returns to land and capital, if policies are not biased against labor. We have shown that there is a great reserve of land and capital on the "internal frontier" (torpid land and capital that are underutilized and turning over slowly) ready to combine with more labor, in response to small additional incentives. We have hinted at what such incentives might be. Next we look closer at tax bias against labor.

B. How Taxes Induce Land and Capital to Displace Labor

The tax system affords few shelters for the wage or salary earner. Income and payroll taxes are withheld, beginning fifteen and a half months before the tax is otherwise due. All wage income is "ordinary" and taxed at the full rate. If you have any question that the income tax is largely a payroll tax, ask yourself when you last heard of an oil man taking salaried work as a tax shelter. Harry Kahn (1968) found that labor income rose from 66 percent to 81 percent of the base of the personal income tax from 1939–1963.

There was a time when wage tax enthusiasts argued that such taxes posed no disincentive to work because the tax rate was a percentage,

and your best choice before tax was the same as that after tax. (If this logic is valid, it applies equally to income and to payroll taxes. The latter rose from 2 percent in 1949 to 15.3 percent in 1990. They are imposed on the first dollar of earnings, and provide no exemptions or deductions.) If the marginal tax on your wages is 30 percent, combining the payroll and income tax, that argument amounted to a claim that \$14 an hour was as attractive as \$20 an hour, at the margin.²¹ This presupposes that leisure activities, such as going fishing, watching television, spending time with friends or family, or sleeping do not compete with earning an extra dollar. It is reasonable to assume that wage taxes have *some* effect on behavior at the margin, so that some withholding taxes are shifted forward to employers. They, in turn, naturally look for substitutes for labor.

In addition, public policy has influenced the cost of employing an additional worker in recent decades for reasons other than taxes. Any health and safety regulations that vary with the number of employees will affect hiring behavior. The costs of providing fringe benefits, particularly health insurance, have risen dramatically.²² Although pension plans are declining in importance, relative to 401(k) plans, they have had a significant impact in the past.²³ Since those costs have risen precisely because fringe benefits are not taxed, they are indirectly a result of tax avoidance. These hidden costs strongly discourage hiring workers at the margin and thus encourage substituting capital for labor.

The net result is that wage costs (wages, taxes, benefits) are strongly influenced by public policy. The tax system says to employers: "Hire labor, and government will charge you in many ways so that your labor cost is much higher than the worker's real wage." Businesses respond to this upward pressure on labor costs by using more land and by investing in longer-maturing capital than the market would otherwise impel them to do.

The bias against labor and in favor of capital of long duration takes other forms than policies that raise wage costs directly. In order to recognize these biases, we should compare the treatment of taxes on land and capital with taxes that fall on labor.

Consider taxes on the sale of most consumer goods. These taxes raise labor costs either directly (if they are borne by sellers, since

about 70 percent of value added comes from labor) or indirectly (if buyers bear the main brunt of these taxes from their wages). By contrast, sales and excise taxes bear lightly on land. Implicit property income, such as the service flow of one's house, avoids sales taxes. This creates a bias toward property income and encourages overinvestment in land and durable capital.

1. Property Tax Treatment of Land

There are taxes on the transfer of land, but these discourage selling as much as buying. They have a net impact on the motive to hold land, by gumming up the market, which adds to the incentive to buy in advance of need (by destroying the confidence that one can buy at time of need). When it comes to holding land, the tax system is geared to make the burdens light and the rewards great. The incentive to hold land rather than transfer it also encourages longer-term capital investment, which reinforces the anti-labor bias.

The only tax that adds to holding costs is the property tax, and then only the part that is levied on land value discourages holding and encourages the use of high-turnover capital. Even then, the pressure by the land portion of the property tax to promote a higher labor/land ratio in production is relieved by assessment practice. Most assessors give a good deal of weight, in valuing land, to its current use, based on the existing improvements and the gross business conducted there,²⁴ rather than on highest and best use. That is, the "land" tax becomes a tax on using land, not holding it. Preferential assessment laws now require this in many states. (The effects of the property taxes on buildings will be treated below.)

A good deal of land is exempt (although hardly any wage or salary is exempt from income tax). Government land is the largest exempt class. Much of it is let to private people for inadequate fees. Their possessory interests are seldom assessed adequately or at all, and the low fee structure tells them to waste government land to substitute for highly taxed labor. Low grazing fees, for example, let stockmen hold cattle on grass too long, just as low parking rates in cities let parkers hold scarce street space too long.

Turning to the income tax, it bears very lightly on land. The basic abatements for land may be classified and summarized as follows:

1. Covert write-off of appreciated land value, by allocating part of it to an old improvement on the land. Of course, the tax laws do not formally allow land to be depreciated. But since depreciation rules allow property to be depreciated and traded multiple times, the net effect is to allow land to be depreciated in the guise of continuing depreciation of improvements that have been fully depreciated.
2. Many categories of exemptions: (a) imputed income (homes, resorts, hobby farms) coupled with deduction of interest and property taxes; (b) unrealized appreciation (as of advance purchases held until needed); (c) capital gains at death; (d) bequests; and (e) capital gains of exempt "nonprofit" owners.
3. Several ways in which property income is deferred or reduced while costs are treated as current and fully allowed. On the income side: (a) deferred tax on appreciation until realized by sale; (b) deferral of tax beyond date of sale, by several devices; (c) deferral of land use income where there is intertemporal interdependence of income (as by planting orchards); and (d) application of a low "capital gains" rate to realized appreciation. On the cost side: carrying costs and (some) losses are allowed to offset ordinary income.

I have treated some details of these devices elsewhere (Gaffney 1967b, 1970a, 1970b/1971). Some of these abatements are so gross as to amount to 100 percent exemption from tax, and some of these, like covert write-off, are repeatable, resulting in actual subsidies in lieu of taxes for holding land. This is double-, triple-, and quadruple-"dipping" much more serious than what currently goes by that name.

While keeping taxes on land holding low, government arranges high rewards for landowners by building public works, as well as by the whole complex of allied policies to support and sustain land values. Local works may be charged in part to local property taxpayers, but there are large federal tax favors here, too. Local bonds are exempt from federal income tax,²⁵ and are repaid from local taxes that are expensable (debt amortization in advance of economic depreciation should really be capitalized). Incomes peculiar to land like

ground rents are not taxed as sales. Capital gains and imputed income also escape.

The result of all of these tax biases is a highly inflated incentive to buy more land than needed, sooner than needed, and to hang onto it longer than needed. Ernest Fisher (1933) describes this process as “the advance of urban uses into the penumbra” of a city, which involves premature platting and subdividing of land far from current residences and worksites. This in turn results in spreading people and capital thinly out over much more land than needed, and the next chapter will reveal how this creates instability in the banking system. This process of spreading out necessitates pumping billions of dollars of capital into stretched-out roads, pipes, lines, wires, and other linkages that tie the fragile web of society and economy together. Localities attract large capital resources to sink into extensions of low productivity, high risk, and deferred or imagined benefits by mortgaging the tax power to general obligation bonds. State and federal governments pour in additional capital, as by the Highway Trust Fund. None of this public capital is subject to any property tax, and only an eccentric public accountant would add a shadow tax to the capital to show its real social cost.

Yet it is just such an eccentric public accountant who is most needed now. The federal government is poised to engage in an orgy of capital investment in high-speed rail lines and other infrastructure with either negative returns on the investment or, at best, very slow and delayed payoffs. The possible elimination of the capital gains tax will exacerbate the problem of capital lock-in. All of this is being done in the name of creating macroeconomic leverage, to get the economy moving again.

Investing in infrastructure will create fewer sustainable jobs per million sunk than it would if invested in almost any other way—as it would have been if not taken for this use. There is a one-shot payroll only. After that, the value added by the facilities is added mainly by the unrecovered capital and land, and the factor input is mainly capital measured by interest, the hire of unrecovered capital. The capital per job is uncommonly, inordinately high above the mean.

As to investing in land, this creates no jobs at all, it is a zero-sum transaction for the whole nation or economy. A buys, B sells, they

create nothing, destroy nothing. It is the same with most old buildings and other capital, and with most common stocks. The stock exchanges are mostly just casinos where people bet on the futures of existing assets. Only a few stock sales, the initial public offerings (IPOs), raise capital for new net investing, the “I” of standard macro models. Earlier Keynesians such as Walter Heller understood this full well. Over the years since then, owners of land and old buildings have slowly induced Congress and various economic advisors to gloss over the difference between creating new assets and buying old ones, so tax favors to the latter are now granted with the rhetoric of fostering the former. This has become a major source of confusion in the public dialogue, and of counterproductive tax policy.

Returning to the money spent on durable infrastructure, it recycles, but that will simply create inflationary pressures, since the economic activity generated will be slow to yield benefits. The fund of real capital stops revolving; active capital is converted to a torpid form. Ripe goods are not delivered to consumers, and the investor does not recover his capital to reinvest. The real capital advanced to workers now lies buried in the ground, unavailable to meet money demand in the next round of consumption. The policy only makes sense on the premises built into modern macroeconomics: (1) that there is a bottomless cornucopia of latent capital formation waiting for demand; and (2) that inflation is a remote danger. That premise has proven contrary to fact in the past. We will return to these macroeconomic questions below.

In addition to tax-induced waste of “land” in the narrow sense, there is the same for minerals. The set of tax subsidies to hype up minerals exploration and production are by now well known, and I merely remind you of the depletion allowance based on a value whose accrual was never taxed as income, use of wellhead value rather than *in situ* value as the base of the allowance, expensing of dry holes and intangibles, and capital gains treatment.

When it comes to extracting foreign resources, there are the foreign tax credit, tax exemption of ocean shipping, transfer of profit to lowest tax jurisdiction, tax deferral on unrepatriated profits, and the like. As to the property tax, assessment is at its lowest when it comes to minerals. There is negligible property tax pressure to utilize domestic

minerals, nothing at all comparable to the income tax incentives to go after foreign minerals.

The results of the complex of tax measures are of course complex, and as Alfred Kahn (1964) has shown, they must be interpreted in terms of the cartelized industries, and to this we should add other institutional biases, like the establishment of tenure through exploration and military pressure (Gaffney 1967a, 1972). But the broad results are analogous to those for other land. We spread ourselves too thin by overstimulating foreign production relative to domestic, and overstimulating exploration and capture relative to production and conservation. We thus involve enormous extra outlays for pipelines and infrastructure, and the foreign investments involve even greater outlays for military support. Military outlays may be regarded much like the extension of a municipal service such as police protection to new suburbs.

The mercantilist metropolis makes the world its suburb. Like other outlays, these tie down capital until the flow of benefits returns the costs. It is symptomatic of the capital intensity of military outlays, if not definitive, that the \$343 billion in interest on the national debt in FY2008 (U.S. Council of Economic Advisers 2009: Table B81) about equals the U.S. military budget prior to the wars in Afghanistan and Iraq (Sharp 2008). As the debt is rolled over, its cost can only go up.

In their efforts to promote full employment with indiscriminate investment incentives, dominant modern macroeconomists tend to think of all production as good. But extracting more primary products with a high natural resource content, like oil or aluminum, is the substitution of land for labor, just as much as is spreading labor thin over farmland. In addition, lavish use of materials and energy for labor is the prime source of pollution and generation of residuals, both of which in turn require space and drive away people. Thus, in respect to minerals and hydrocarbons and most exhaustible resources, as with other land, the tax system induces the use of too much, and requires large capital outlays to do so (Rose 1974; Gaffney 1967a, 1976b, 1982).

2. Property Tax Treatment of Capital

Next we look at the tax treatment of capital. The property tax hits some kinds of capital, and rather hard. But public capital, as noted

already, is exempt, and affords a wide avenue of escape. Much other capital is also exempt, or given preferential low assessment. Timber makes a good example. Timber is almost everywhere underassessed by custom or law. The argument is that the investment would not pay if taxed, because of its long life—that is, its heavy use of capital. Yet when is the payroll tax or income tax abated because a labor-using business cannot survive it? Preferential treatment of timber is granted in almost as many ways as there are states. Ellis Williams (1968) has summarized these as exemption or rebate, modified assessment, modified rate, deferred payment, yield tax, and severance tax.

A good deal of other capital is exempt as well. Anything on legs or wheels or water is hard to catch on assessment day, as are consumer durables, and most jurisdictions have stopped trying. But business inventories, which are short-lived, are hit hard.

Buildings, which are durable and capital-using, are hit hard, too. This would seem to constitute a bias against use of capital, and it certainly is a bias against improving land. But the effect on the individual building is reversed because the property tax is levied locally, and local governments use zoning and other controls to protect and fortify their tax bases. The thrust of local zoning, building codes, subdivision controls, occupancy limits, condemnation power, and “sewer power” is to raise the capital requirements of residing in a town. The net result is doubly bad. We get more sprawl, raising infrastructure capital needs, and more capital per dwelling unit on the land that is used.

3. Income Tax Treatment of Capital

Turning to the income tax, it contains many loopholes and abatements for capital, and these generally are geared to favor capital of longer life. I will itemize five basic classes of preferences for flowing and growing capital, beginning with flowing.

1. Fast write-off and expensing. Whenever one writes off an asset faster than it actually depreciates, the effective tax rate is lowered below the nominal rate (for mathematical proofs, see Gaffney 1967b, 1970b/1971, 2006). Expensing is best of all, of course, being the fastest, and it lowers the effective rate to zero. It means the

treasury in year one puts up a share of the capital investment equal to the tax rate, and thereafter gets only a return on its own investment.

Some important capital outlays that Congress lets be expensed are costs of minerals exploration, intangible drilling costs, research and development, advertising, rearing breeding livestock, starting orchards, soil and water conservation, many costs of land development²⁶ (Hoover 1970: 42), interest and property taxes incurred to carry growing capital, losses incurred to create goodwill or appropriate resources allocated by user rights (like air routes or water rights), any investment of unrepatriated profits abroad, price-war losses incurred to capture markets, movie making,²⁷ and so on. One can see from the list that expensing is granted more freely to growing than flowing capital. Growing capital is the kind that ties up capital longer before any is recovered.

It is a constant theme of interest groups, both private and public, that profits are not profits but costs if reinvested in the same business in which earned. Strange as it seems to an economist, there is a ready audience for this fallacy.

Almost all income-yielding capital is fully tax-depreciable well before its service life is over. About the only kind depreciated slowly is that of regulated utilities, to maintain the rate base and pass through the higher taxes to consumers.

2. Recapture of excess write-off. There is double-dipping allowed when capital is sold and redepreciated. The excess of sale price over book value is taxed as a capital gain, to "recapture" the excess depreciation, but recapture is several years after write-off and at the lower capital gain rate. The longer capital lasts, the more dips are possible. Buildings are the main beneficiaries. Besides their long life, they have the advantage of being confusable with land, and a good deal of land value is written off normally with each dip, even though the land value is rising.

"Recapture" of excess write-off is based on a sliding scale, the lower rates applying the longer the capital is held. This helps limit the number of dips, but adds to the favoritism shown to longer-lived capital.

3. Tax-free imputed income from housing. Consumer capital in houses and hobbies yields a tax-free imputed income, just as land

does, coupled with deduction of interest and property taxes and indefinite deferral of capital gains taxes. If I am solvent and never move to a cheaper house, I can defer the gains until fiscal extreme unction, forgiveness at death. The capital gain may derive mainly from the land, but to claim the land as residential I must have a house.

If I hire workers to build or improve my house, that is not deductible. If I pay out for repairs and upkeep, that is not deductible. The exemption is to the return on capital, the service flow in excess of cost. The more durable and capital-using the house, the greater share of the service flow that is. A cheap house or trailer, a shelter of low capital requirements, benefits little from this exemption. The benefit is to capital.

Here we meet an exception to the rule of no loopholes for labor. Labor on one's own house is tax-free. There is even some inverse relationship between the capital in shelter and the labor input required to keep it going. On the other hand, the opportunity for tax-free labor requires that one own a house, and the more land around a house, the more the opportunity. The greatest outlet for home labor is when combined with land and capital.²⁸ A material share of the value of country estates and farms doubtless derives from their outlet for tax-free labor. The farther one gets from the exchange economy of cities and the nearer to self-sufficiency, the more labor is tax-free. In addition, it is relatively wealthy men who can afford to keep wives at home who do not work for cash. The tax-free labor of housewives is a bonus for the leisure class, of much less value to the waitresses, seamstresses, scrubwomen, and maids who labor in the houses of others.

The income tax is a tax on sale and exchange of labor rather than on home labor—a critic might say on social behavior rather than narcissism. But on larger landholdings there is room to reap the benefits of specialization, cooperation, exchange, and society and still avoid taxes, by internal barter. In the later days of the Roman Empire *patrocinium* became common, evolving into the early feudal system. The overtaxed citizen commended himself to be a “client” of the large landowner “patron” to escape the heavy hand of the publican (Thompson and Johnson 1937: 293–295). Today on large paternalistic ranches we see the same forces in a less aggravated stage, and in

tax-free religious brotherhoods of Hutterites and Mennonites the modern counterparts of old ecclesiastical benefices. There are many reasons why Houthakker (1967) found the farms of Texas to report no net taxable income whatever, but one reason is the outlet they offer for tax-free exchange of labor.

Thus the tax loophole for labor is open mainly to those owning land and capital. This narrows the loophole so that it hardly compares in scope with the exemption of imputed income of owned land and capital. The landless proletariat seeking tax relief has to resort to welfare and crime. For sentimental reasons, tax benefits to homeowners are popular, along with many other subsidies, like cheap credit pumped in via the Federal Home Loan Bank Board and the host of predecessor and ancillary agencies. In result, capital is diverted from commerce and industry (the taxpaying branches, at least) to homes. Yet capital in homes complements labor less than capital in offices, stores, factories, inventories, and so on. It makes no workplaces, it needs no processing, and it lasts much longer.

4. Deduction of interest and property tax. These costs of carrying capital are fully deductible from ordinary income, even though the income from capital is wholly or partly exempt from tax.

5. Investment tax credit. This on-again off-again device lets investors in many kinds of capital reduce their taxes by 7 percent of the investment. After that, one may depreciate the whole amount as well. This device has the potential of favoring shorter over longer investments. In form, it is a premium on replacement, and thus labor-intensiveness. It could be a powerful device for quickly causing capital to combine with more labor. But Congress has forestalled this by permitting the credit only on a sliding scale, favoring longer investments. The credit is not fully allowable for investments whose estimated economic life falls short of eight years. The net result is a lower overall tax rate on capital than on labor.

Those five abatements move investors to prefer capital-using over labor-using techniques, and combine more capital per worker in all processes. In addition, the abatements are biased among forms of capital, consistently favoring those lasting longer. Capital cycling in less than a year is treated very harshly. It hardly achieves the status of "capital" in the eyes of the law. Economists have strung along,

letting “investment” refer to buying capital to last longer than a year and appearing quite unconcerned over the logical, definitional, and modeling problem in drawing so arbitrary a line between “investment” and consumption spending.

The investor who recovers capital inside the year reports his costs and revenues on the same tax return, even though they may be nearly a year apart. He might gain by straddling the year-ends, but the IRS, so careless with intertemporal advantages gained by owners of durables, is vigilant to this and forbids him to deduct the cost of goods not sold.²⁹ The effect is the same as requiring that increased inventories be reported as income. The Treasury will not help anyone finance working capital as it does durable capital. *Eisner v. Macomber*, the 1920 case that protects land, timber, mineral reserves, stocks, and so forth from taxes on unrealized gains, does not apply to accumulation of inventory. The rules are bent against goods of higher labor content.

There is a concession to phantom inflationary inventory profits in LIFO accounting, but “very complex rules are involved and . . . LIFO is not ordinarily used by small business” (U.S. Department of the Treasury, Internal Revenue Service 1965: 26). It is tailored for larger business—the ones that need more capital per worker.

As noted before, recapture of excess depreciation is taxed on a sliding scale, the rate declining with years held—another favor to long life.

Improvements to land that add to sale value receive capital gains treatment, with all the many favors that implies. Unlike the cost of inventories, which is not deductible until sale of goods, these costs are often expensable and nearly always depreciable long before sale. Land improvements are of course more durable than inventories.

Depreciable lives are generally based on arbitrary classes of assets, regardless of actual service life. The more the service life exceeds the write-off life, the lower is the effective tax rate, a clear tax incentive to build in more durability. Depreciation paths are also important. Straight-line tax depreciation is most common, but shorter-lived assets like, say, a delivery truck, depreciate like the *Blue Book* value of cars, faster than straight line. They get the tougher break. Buildings, on the other hand, depreciate slowly at first, along a path like the declining

balance of an installment debt. But the IRS allows them accelerated depreciation (double-declining balance and sum-of-the-years'-digits.)

Thus there is a consistent and pervasive tax bias in favor of capital, and among capital assets in favor of the longer-lived. That this is so consistent, and often explicit,³⁰ points to some sort of conscious intent, or systematic bias.

The above referred to flowing capital. Growing capital, which on the whole ties up capital longer, and admixes more interest input with the original labor input than does flowing capital, is treated even better. The basic tax subsidy to growing capital is deferral of tax to date of sale. Income, in the meaningful definition of Haig (1921) and Simons (1938), occurs when value accrues, that is, each year as the value grows. Thus growing capital is taxed after the income accrues, and the longer the wait, the greater the benefit. In effect, by deferring taxes, the Treasury helps finance growing capital (except ordinary inventories of short life).

Associated with that is a greater propensity of Congress to allow expensing of the capital cost of growing than flowing capital. Agriculture makes a good example (Dangerfield 1973; National Planning Association 1972). Under the cash-accounting privilege allowed to farm business, a "farmer" can deduct expenses of materials and services that "actually go into or are a part of a final salable product—such as feed, seed, stud fees, and management services" (Dangerfield 1973: 15989) Machinery and building improvements have to be capitalized—they are flowing capital. Capital that falls in a twilight zone between the classes includes costs of raising livestock held for draft, breeding, or dairy purposes, and costs of starting up orchards and vineyards. These, too, are expensible, even though some orchards may bear for 80 years. Breeding stock may be depreciated as well—another case of double-dipping—and their sale not be taxed until the "herd" is liquidated, an incredible package of special privilege for the kind of livestock that requires the most land and capital per dollar of value added, to say nothing of per unit of nutritive value (Houthakker 1967).

Some large classes of growing capital are timber, livestock, minerals (the portion of their value added by discovery and development), some kinds of knowledge, orchards and vineyards (for part of their lives), and liquors. Most inventories are growing capital, but the bulk

of them turn over within a year and enjoy no tax subsidy. Most of those listed are greatly favored, however.³¹ As a result, investors seek to maximize tax-sheltered assets and minimize assets that are not sheltered. They substitute growing capital, like cattle, for flowing capital, like machinery or buildings.

Again we take timber as an example. Although the tax is deferred until sale, the carrying costs of timber, interest and property taxes, are expensible as you go. On the other hand, the cost of labor used to reforest bare land is not an expense; it must be capitalized and not deducted until sale. In addition, timber sales get capital gains treatment, although the interest and property taxes are expensed from ordinary income. The labor cost that had to be carried forward to sale is now deducted only from the capital gain.

The main labor cost is logging. We omit that here because we are illustrating just the stage of timber growth, terminating in stumpage. Logging begins a new cycle, one of processing the stumpage to make wood products. This in turn terminates in delivery of finished lumber to a building site, where a new cycle begins with onsite labor converting lumber into housing.

Ordinary profit from vertically integrated downstream sawmills may be shifted to timber and get capital gains rates by the firm's nudging up shadow transfer prices. The IRS watches these prices with some diligence, and it is not certain that fictional internal prices get by. But there is every incentive to raise nonfictional transfer prices by letting timber add more value on the stump at capital gains rates before becoming a log, processed by labor at ordinary rates. In the mills, value added by labor is taxed at ordinary rates, and so is the value added by profit.

4. Inflation as a Tax

Some of the gains subject to tax are illusory results of inflation, and on this basis one might think tax preferences are needed merely to prevent higher effective rates on growth of capital. The undeducted cost basis of ripe timber is however negligible, in any case, next to its merchantable value, so this does not amount to much. Carrying costs have been expensed right along.

In general, inflation adds to motives to hold real assets, for these reasons:

1. Inflation of property values has outpaced wage rates. The illusion would be to overlook that wealth holders as a class have gained on tenants, young people, pensioners, and depositors.
2. Inflation is an annual tax on holding money. Taxing the rise of equity values merely redresses the balance, and fails in that by a wide margin, because the inflationary loss is immediate, while the gains tax is deferred. Inflation hurts the most those whose need for liquidity is high relative to their real assets. These are those whose volume is high relative to their capital because liquidity needs vary with volume. That is, these are those whose capital turns over fast. Lampman's study (1962) of the concentration of wealth found that money and near-money as a share of wealth declines with total wealth, so that inflation as a tax has a regressive quality compared to taxes on real wealth.
3. Inflation lowers the real cost of borrowing. Owners of real wealth are the major borrowers, and leverage is the name of the game. Inflation has advanced them capital at very low real rates of interest, another subsidy to holding capital.
4. In terms of bias between long- and short-lived capital, gains on short-lived capital are equally the product of money illusion but are taxed sooner, and at ordinary rates.

Some economists have argued that "phantom profits" should not be taxed. By that they mean that capital gains should be indexed for inflation.³² That would result in larger depreciation write-offs over time. This strikes me as a one-sided and unbalanced view, which overlooks points 1 through 4 made here. Inflation on balance favors the longer-lived assets. Indexing would only worsen this bias (Gaffney 1991).

5. Corporate Income Tax

Turning to the corporate income tax, it is biased against income from corporate property by double-taxing it, or so it would seem. Yet the corporate form is so useful a device for sheltering property income,

regardless, that some wealthy people set up personal corporations for tax avoidance. This calls for a second look.

Corporations are able to avoid the double tax by not taking cash out for a long time, thereby converting the shareholders' ordinary income into capital gains, forgivable at death. Public corporations, too, are moved to plow back profits. This puts more capital each year back in the control of corporate managers to reinvest, whether or not they have any good ideas. The capital does not have to meet the test of the market; it is free of all cost but the range of opportunities of the particular management. Thus the net impact of the tax system is to make internal capital artificially cheap to corporations, and push them into ventures of deferred payoffs.

In addition, of course, corporations avoid double taxation by financing with debt, and their collateral security rises in step with their retention of earnings. They also finance internally from pension funds, totaling \$2.7 trillion in 2007 and \$1.9 trillion in 2008, the income free of income tax (Board of Governors of the Federal Reserve Board 2009: L.118b). Borrowing requires collateral, and law and custom favor solid, durable capital as the thing to pledge. As to excise taxes, which raise about twice as much revenue from business as corporate income taxes, their impact is like that of income taxes, only more so, because costs are not deductible. Excise taxes, in effect, tax capital each time it turns over. The busy merchant who turns his capital several times a year is taxed on it as many times. But the same capital in a tree is taxed only once at the end of 80 years or so.

If tax bias were the only institution to favor wealth over labor, we could say it may offset other biases, but in fact there are reinforcing biases, which I will merely list:

- regulatory bias and the Averch-Johnson effect, or the tendency of rate-regulated firms, such as utilities, to expand their capital base beyond an efficient level to maximize returns (Averch and Johnson 1962);
- licensing laws that dispose of resources, franchises, and monopolies subject to heavy capital requirements; for example, a taxi medallion in New York City in 2007 cost \$600,000, and the price

has appreciated 14 percent per year over the past 50 years (Business Wire 2007);

- subsidized low-interest loans and use of low interest rates in planning public works, both of which encourage investment in projects with excessively long maturities and slow payout;
- ignoring opportunity costs of public land, which encourages government to substitute land for labor at the margin;
- logrolling, overcommitment, and resulting stretchout of public works, all of which is justified politically by the claim that public works provide employment;
- the Highway Trust Fund, which promoted overbuilding of the federal highway system in the past, and that now imposes a large maintenance burden on present and future generations;
- the price-umbrella effect that builds excess capacity into cartels and allows cartel members to overinvest in capital.

There are more, and I know of no comparable set of biases favoring inputs of labor.

C. Capital Investment and Capital Turnover

We have already laid the basis of the present argument and recapitulate briefly before moving into the macroeconomics.

If there were no capital, the way to make jobs would be clear and simple. We would tax land value as the property tax does, as a regular fixed payment based on value, not varying with use. This would put pressure on owners to intensify. We would not tax them for hiring labor and selling products. They would use more labor on less land and solve our problem. And this is still a big part of any solution, regardless of capital. We must use more workers per acre.

Since there is capital, the problem has a third dimension. We need to use more workers per acre, and also do it more often. The form of capital we create affects both relations—that is, how many and how often.

When capital is short and land is dear, we not only need to use less land per worker, we also need to use less capital per worker. It is not that more capital would not be good if we had it. Voluntary saving is splendid, and taxing land will doubtless encourage it by lowering

the value of that asset and prompting people to fill the void with real capital formation. But at any time, we want to make do with what there is, and just now we need to make a short supply go around much further. The market will do it for us if we let it.

Investments differ widely in “valence” for labor, how much labor they mix with capital. So investments that take capital from job-creating uses of high-labor valence to sink it into other uses of low-labor valence are not helping make jobs. Unrepatriated capital overseas is not making jobs in the United States, except as Americans emigrate with it. Some capital, like cattle, has a high valence for land and deprives labor of land, as well as of capital in other forms. Some capital, like that in a giant strip-mine excavator, combines one operator with millions in capital and land, and hardly compares with one sewing machine, which also requires one operator and a few square feet of floor space. But our well-intended effort to increase output per worker and thereby increase wages tells us we should subsidize investment to employ labor, reduce taxes on capital, and finance tax-exempt public works, and so on.

They tell us that labor produces capital anyway, so how can capital displace labor? In effect, they tell us that if capital does not always combine well with labor in parallel, it still combines in series. In other words, even though we know a machine may replace several workers, we take comfort in the fact that labor was required at an earlier time to make the machine. It seems in that vague way that creating labor-saving capital and creating jobs balance out. So, as politicians and economists rationalize, the key to jobs is investment. And here they lead us into folly.

We see investment in, let us say, a large storage dam as using workers, but not as freezing up scarce capital. We can *see* the labor that goes into producing the dam, but we *cannot see* the service flow from the dam produced by the capital input. That invisible flow of services is comprised of the interest on the unrecovered principal over the life of the dam, which accounts for and soaks up most of the imputed cash flow. We see the demand for construction labor and think it is a net increase, but forget that the financing takes funds and thus real capital from alternative uses. Since those other uses of capital are likely to combine with labor more frequently than the capital

tied up for decades in the dam, this is an example of how heavy construction slows down the aggregate economy and destroys labor opportunities. Each dollar frozen in concrete contributes to shortage of capital reinvestment and reemployment. We pay bread today for stones tomorrow.

It might be thought that I am overemphasizing the life of capital and should consider that capital combines not just with labor that produces it, but also with labor that works with it. Thus a factory "makes jobs." However, the factory produces goods, too, which are capital of some life. If we think of an economic matrix in which we match all capital with the labor that produces it, then we have a comprehensive tableau. Further matching would be redundant and might double-count. That is, we can measure factor proportions by vertical integration, as I am doing; or alternatively by horizontal integration, as in a normalized model; but not by both at once.

We think that "intensive land use" must be good for labor, but forget that trees and livestock and farm machines and fully automated plants and the blank sterile walls of many modern city buildings drive labor off the land and last too long to hire reconstruction labor very often.

Long life of capital can mean high intensity of land use without much labor. The problem is that to encourage investment we lower the cost of capital, and move investors to use it lavishly in place of taxable labor. We forget that the job-creating efficiency of capital varies from one use to another, and our measures to promote investing lead capital into the least job-creating uses, where capital substitutes for labor, because we make capital look cheap and labor look dear.

D. The Microeconomic Basis for a Correct Macroeconomics

The great, the overriding fault of modern macroeconomics is its homogenized treatment of investments. One investment is as good as another; only the aggregate matters. We must distinguish among investments. Adam Smith, as so often, gave us a morning star of light on the subject. Smith said:

The quantity of that labor, which equal capitals are capable of putting in motion, varies extremely according to . . . their employment . . . A

capital . . . employed in the home trade will sometimes make 12 operations, or be sent out and returned 12 times, before a capital employed in the foreign trade of consumption has made one . . . the one will give four and twenty times more encouragement and support to the industry of the country than the other. ([1776] 1937: 338, 341, 349)

1. Historic Recognition of Capital Turnover: Smith, Mill, Wicksell

Mill was like-minded. He and Smith saw “circulating” capital as “setting labor in motion,” and “fixed” capital as not. Mill said:

[C]apital may be temporarily unemployed, as in the case of unsold goods . . . [D]uring this interval, it does not set in motion any industry (§2, p. 41) . . . [C]apital may be so employed as not to support laborers, being fixed in machinery, buildings, improvement of the land and the like (§3, p. 41). . . . Capital is kept in existence from age to age not by preservation, but by perpetual reproduction (§6, p. 47). . . . To set free a capital which would otherwise be locked up in a form useless for the support of labor, is, no doubt, the same thing to the interests of laborers as the creation of a new capital (§9, p. 52) (Mill 1872: BK. I, Ch. V) . . .

[A]ll increase of fixed capital, then taking place at the expense of circulating, must be, at least temporarily, prejudicial to the interests of laborers. . . . Suppose . . . a capital of 2,000, . . . half . . . effects a permanent improvement. . . . He [the capitalist] will employ, in the next and each following year, only half the number of laborers. (Mill 1872: BK. I, Ch. VI, §2, p. 59)

Unfortunately, Smith and Mill never got the bugs out of their wages fund theory, which never became fully coherent and operative. In spite of the above quotations, it seemed to some that the “fund” could not increase except by slow increments of capital formation. Knut Wicksell (1934: 194–196) corrected this with:

a true view of the famous wage-fund theory . . . Capital in its free form is employed to advance both wages and rent. . . . If . . . a given capital . . . is employed year after year, . . . then each year about an equal part of that capital will be set free. That part . . . constitutes the whole production of finished commodities and services [of capital] of the year. When the capitalist class has taken the surplus . . . it must, in order to maintain its capital, reinvest the remainder—which it does by hiring labor and land for new production. This part, therefore, is . . . the annual wage-fund. . . . The wage-fund may undergo considerable changes, in so far as the average period of turnover of capital is lengthened or shortened . . . it is only the part [of capital] annually set free which can purchase labor (or land).

“It is only the part of capital annually set free which can purchase labor (or land).” Here I think we have the basis for a correct macro-

economics, one that can exorcise the fallacy that investment of any kind adds to real demand for labor merely by recycling money. The only kind of investing that purchases labor truly, without the fraud of inflation, is investing that corresponds to delivery of real goods to consumers at the end of the pipeline. These real goods are the “capital set free which can purchase labor.” This is what turns paper money into real money.

This device suddenly ties together micro- and macroeconomics nicely. The way to use more workers with capital is to turn and recover the capital more quickly. This is also the way to increase aggregate demand for labor. By far the bulk of the gross investment that generates payrolls has its source in the recovery of capital by sale of ripe goods and the services of flowing capital to consumers. Recovery and reinvestment of capital are the prime movers of the economic machine.

Wicksell saw capital soaking up any surplus labor:

If . . . more labor is available than can be employed . . . a shorter period of production . . . is adopted, and the capital which was before insufficient is now able to give employment to all workers. (1954: 127)

He saw social capital as a wage fund, but a fund that can sustain any rate of flow because it revolves. This Great Revolving Fund does not limit wages. By recycling faster it employs more workers up to any needed number, and it speeds up when stimulated by lower wage rates and higher interest. In the idiom of modern macroeconomics, this increases replacement demand. Aggregate demand can fall short of full employment if capital turns slowly, but faster replacement corrects things and fills the gap. Thus, “the existing capital must just suffice to employ the existing number of workers” (Wicksell 1954: 160). The greater replacement demand is financed by greater capital recovery, and matched by a greater flow of finished goods, so it is not diluted by inflation.

Let us look at Wicksell’s device³³ as a way of meeting the national payroll with a small capital. He was telling us, in effect, that the economy can do what the small businessman has to do all the time. He has to recover his capital quickly each time he sinks it, if he is to meet the next payroll without dropping workers.

2. *A Homely Example of Business Turnover*

Consider a baker on a busy corner open 365 days a year, with working capital of \$200. To keep it simple, assume payments are made daily, and he spends the first day setting up, making no sales, but sinking the \$200. Half goes to pay the payroll for the first day, half for feedstock, and we will ignore overhead for simplicity. Thereafter, the baker sells out each night. The \$100 that turns over each day will finance a daily payroll of \$100 or annual payroll of \$36,500, plus an additional \$100 flow of net production above cost. To this amount, he need add only \$10 for 10 percent interest on \$100 of his working capital.

As a rough rule, the flow (F) one can handle equals the capital (K) times turnover (T). So, $F = K \times T$. The average payout period (P) is the reciprocal of turnover ($P = 1/T$). So, $K/F = P$. Using the above example:

$K = \$200$ of working capital

$F = \$200$ per day of output (\$100 for payroll, plus \$100 of net production)

$T = 1$ (capital turns over every day); $P = 1/T$ also equals 1

$F = K \times T$, so $200 = 200 \times 1$

$K/F = P$, so $200/200 = 1$

In annual terms:

$F = \$73,000 = K \times T = 200 \times 365$

$T = 365$ (stock turns over 365 times per year), so $P = 1/365$

If it took two days instead of one to sell out, then T would be 0.5 (meaning half the stock turns over each day) and therefore P (or $1/T$) is 2. (In annual terms, T is $365/2$ and $P = 2/365$.) In order to balance the equation, so that $K/F = 2$, the baker would have to find another \$200 of working capital, or drop half the staff. From this simple example, we can see that turnover is both a substitute for capital and a generator of employment. The slower the turnover, the more capital the owners must provide for each person hired.

The baker must hold down that payout period by scheduling sales so that cash flow balances outgo before running out of capital. If it takes six days to turn over the \$100 of stock, then $K/F = 6$, so $K = 6F$.

The baker must sell the first cohort of goods out in six days, or fail to meet payroll on the seventh day.

As a business gets into financing slower inventories, such as a camera store might have, compound interest adds to the capital required and $K > FP$. If the average payout period (P) is seven years,³⁴ then compound interest at 10 percent doubles the value of each item by the time it is sold. (That means, roughly speaking, that half the price of a typical camera that has sat on the shelf for seven years, waiting for a customer, is the cost of interest for holding it in inventory that long.) The capital required to sustain a payout period of seven years will be 10 times the flow (or $K/F = 10$), rather than seven times, because the cumulative value of an annuity of one over seven years equals 10. Ten percent interest on 10 equals one, meaning the interest cost is the same as the cost of the capital (the stock of cameras in the shop, in this case). The memorable thing about this period is that the annual interest bill now equals all other costs, and takes half the cash flow.³⁵ Meantime, the capital has virtually stopped sustaining any payroll. Instead of being $1/365$ of volume (in the bakery, with extremely fast turnover), capital is now 10 times volume, or 3,650 times as much per job.

The demand for labor does not depend primarily on the amount of capital, then, but on how fast it turns over—how active it is. Each time capital cycles, it combines with and activates labor: every investment in payroll creates labor income equal to capital on the first round. But for sustained impact it must keep recycling. Paybacks deferred are payrolls denied.

If you recover capital slowly, you constantly need more money, until you reach an equilibrium with cash flow balancing outflow—which by this time includes very large interest payments on all the unrecovered capital.

Some firms and agencies have gone on for decades without reaching that balance. The Bell Telephone Company is notable. In 1971 it went to the market for \$4.5 billion in outside capital, about 20 percent of all the new capital raised from stocks and bonds by American industry. “But it will take another 30 years, according to Bell’s plans, for electronics switching systems to displace the older (electromechanical) equipment in the telephone network” (Business Week 1972: 57–58).

3. *The Great Revolving Fund*

The U.S. Bureau of Reclamation makes another case. In 1902, Congress endowed the new bureau with the Revolving Fund, to be recouped and reused every 10 years. By now it was to have completed 11 cycles (\$11 of dams for each \$1 of capital), and might have, except for one problem: it has yet to complete the first. Each new project has drained capital from elsewhere—and frozen much of it tight. Instead of activating much labor, the bureau has deactivated much capital. In the process it has also frozen scarce waters in farm uses in areas where that use is seriously obsolete, so the capital is a public nuisance.

Normally, a company can be viable only if the cash flow from its operations allows it to recoup its capital periodically. To do that, its payback period must be short enough that its income is not entirely consumed by interest expense (or imputed interest in the case of government projects). Many companies invest in excess of depreciation, which means their revenues are insufficient to recover their capital after paying interest. A company can do that—but only by tapping others. An economy cannot, except by new saving. It is a closed system with a zero sum of capital transfers. To meet the national payroll, the economy must deliver the goods, or cut the payroll. The national capital is indeed a Great Revolving Fund. The fund receives inputs from labor and delivers to consumers. Labor and consumption set limits on the throughput, as we know. But so does turnover of the fund—and that has been neglected.

Meeting the national payroll has two sides: spending money for work, and delivering real goods to back up the money. Turnover generally balances the two sides nicely. Replacement anticipates liquidation. The keepers of the fund—capitalists—anticipate the maturity and sale of their goods, and pay workers to replace them. This gives workers the income to buy the ripe goods. (Along with turnover there are net saving and investment, but these are small next to turnover—too small a tail to wag so big a dog, as mainstream macroeconomics would have it.)

Most macroeconomists take care only of the spending side, the money payroll. Their fault is to assume that delivering the goods takes care of itself. Turnover is assumed mutable, totally accommodating in response to the touch of spending.

The fact is that turnover itself determines spending, since replacement anticipates liquidation. In other words, the production for which workers receive wages is primarily the replacement of capital that is worn out, moved out of inventory (by final sale), or otherwise depleted. Consumer goods are technically capital (inventory) until the moment they are sold to a household, so the basic reason for sluggishness of an economy is the buildup of capital so that it does not need to be replaced. In that way, turnover becomes a bottleneck. The flow of income cannot exceed $K \times T$, capital times turnover (plus direct services).

Mainstream macroeconomics cannot address this problem any better than the guns of Singapore, facing out to sea, could turn around to meet the Japanese attacking by land. "Think spending" and "Discourage deliveries" are its motifs. That Keynesian adage presupposes that the fundamental macroeconomic problems are underconsumption, oversaving, underinvesting, and liquidity preference. If the problem is perceived as how to remove surplus goods from the market, the doctrines and policies that result will welcome investments with only deferred benefits. These create money incomes and no consumer goods. The result has to be inflation.

The "New Economics" mocked Say's Law and taught two generations that supply does not create its own demand. Today's problem seems to be that demand does not create the answering supply. Merely spending money is cheap, and easy to arrange when you have your hands on the levers that control money supply and government debt. Delivering real goods is harder.

Smith and Mill sound quaint today when they say that the office of capital is to advance subsistence to labor. We should have more such quaintness, rather than doctrines that would advance money to labor without subsistence to back it up, so that it shrinks in your hand. We have traded on the symbol and denied the substance until the symbol has lost its power to command.

4. Capital Replacement as the True Source of National Income

Mainstream macroeconomics does not omit turnover from its equations. Rather, it buries and obscures it by keeping it implicit. This occurs when one treats "consumption" as an income-creating

expenditure. Consumer spending as such does not create much income; it takes off the shelf goods already produced. Replacement of liquidated capital is the spending that creates income. There is disinvestment and reinvestment. In macroeconomic logic these two transactions are netted out, so consumption creates income, and only the uncleared balance shows up as net investment—which is what “investment” means in modern macroeconomic logic.³⁶ The great mass of gross investment is called consumption. The turnover of capital required is assumed to occur passively, automatically, accommodatingly. Only it doesn't. Turnover has its own set of determinants, including the tax biases we have surveyed. Furthermore, since replacement anticipates liquidation, and the time for liquidation depends largely on the physical character of the capital in question, turnover plays a strong role in determining income and consumer spending, rather than the other way around. It is the pacer, not the paced. Consumer spending is the result, not just the cause, of the ripeness and sale of goods. It is this that keeps balance between aggregate demand and supply.

This is the missing link in typical macroeconomic thinking, enmeshed in its doctrine of consumer determinism. It is replacement, mainly, that determines gross investment, which generates most income. Replacement in turn is determined by the schedule of maturity of capital in being.

This analysis would seem to explain better than orthodox macroeconomics our current predicament. Contrary to that orthodoxy, replacement spending falls short because of a shortage of ripe goods, not a surplus. If too much capital is invested in capital of long maturity, which loses its value when interest rates rise in a downturn (e.g., buildings on marginal land), it ties up capital that might have been invested in short-term working capital (e.g., the feedstock used in a bakery). Excess production of the former prevents sufficient production of the latter. If there are not enough jobs to go around, it results from too few goods flowing out the pipeline, not too many. In the aftermath of a period of explosive investment in long-term projects, there will be a shortage of ripe goods, which requires that they be rationed. Unemployment is the rationing agent. If there is not enough consumption to employ all

workers, it is because there is too little to consume. It sounds very much like stagflation.

What's happening is that turnover is too slow. A lot of good capital is simply wasted and lost forever, too, which is worse in the long run but not very different in the short from freezing it up for 20 years. This means slow delivery of final goods, and slow recovery of capital to reinvest. Reinvestment demand is not inflationary because it anticipates or accompanies delivery of real goods. Lacking adequate reinvestment, modern macroeconomic policy seeks to simulate real demand by creating and recycling money faster. But the policymakers have omitted the second half of meeting the national payroll. They are feeding out paper but not delivering the goods. How can capital be short when there is so much, and when you can buy it so cheap on Wall Street now? Easy. There is plenty of capital stuck in the ground. The shortness is of readily recoverable capital for reinvestment. The shortness raises discount rates and devalues common stock, but cannot transmute concrete into peaches or recycle telephone poles into sugar. The moving finger has written. We have gone astray by thinking that what is good for capital is good for labor. It is a half-truth, and we now have to face up to the other half.

The microeconomic solution to unemployment also contains a macroeconomic solution. An important aspect of substituting labor for capital and land is to apply labor to land more often and recover and reinvest capital more often. This increases replacement demand, which is almost all of aggregate demand, and does it without any inflation. The key to good macroeconomic policy is not net new investment and growth of capital, but turnover, recovery and reinvestment of capital. Favors to capital are not favors to labor unless they come in such form as to accelerate the cycling of capital, as the investment tax credit could.

IV

Conclusion

WHAT CAN WE NOW SAY about how to allocate capital so that its job-creating efficiency will be greater? A number of general rules follow from our analysis.

A. Directing Capital to Enhance Employment

We need to stop regarding high output per worker as an adequate index to efficiency, when this index mainly reflects overapplication of land, primary products, and capital. Labor's interest is in having high marginal productivity, not necessarily average.

We need to foster things that humble folk do, directing capital where its valence for labor is high, and for land low. This does not call for subsidies, but for neutrality in taxation. There is some truth in the old slogan that the rich can best help the poor by getting off their backs. This calls for a considerable shift in values and attitudes, even on the part of the poor, who often think as their own worst enemies (and so remain poor). We need to extract less from the Earth, and to process, recycle, maintain, and service more that we do extract. There is no rigid fixed multiplier, as spokesmen for primary industries allege, by which downstream jobs depend on upstream mining or logging. Cheap logs are butchered; dear ones are cherished laboriously. Cheap wood chips and natural gas are burned off as waste; dear chips and gas are handled with labor and love as feedstock and fuel.

We need to use and improve land more, especially land already within the perimeter of existing streets and roads and utilities. We need to expand less into, and even contract away from, submarginal peripheral hinterlands that soak up so much capital, and return so little, so slowly.

We need to invest capital nearer the consumer, on the whole, and farther from the bowels of the Earth, for the labor content of value-added and service flows generally rises downstream, in processing, manufacturing ("making with hands"), services, trade, and so on. Even housing, much of which is lavish of land and capital, complements labor by sheltering it.

Yet I would not legislate on any of the above generalizations, for they are too vague, too exceptionable. That is why we have a price system, to pinpoint more exactly our goals, and help achieve them. Thus there are sharp differences among extractive industries. Oil is capital-intensive, to be sure, and cartelized as well, which makes it more so. But market gardening is labor-intensive, as shown in Table 1. Strip-mining is land-using and capital-using, but pit-mining uses labor.

We need something more subtle and accurate than a spasm of outrage against primary products. We need pressures that will encourage those primary producers that use more labor, and discourage those that waste capital and land, and will apply the same pressures in the same measure right down the line to the consumer. Again, that is what the market and the price system are for. We can achieve our goals best by working with them, not by throwing them out. The abstract generalizations of price theory often seem sterile and irrelevant because not clothed in material examples, yet they are more relevant to our actual policy needs than anything else because they deal with universal qualities of specific examples.

B. Faster Recovery of Capital

A general rule is that we should invest so as to recover capital more quickly. This means that more of cash flow will be recovery of principal, and less will be net income to the investor (i.e., interest payments). This will cause a faster flow of reinvestment to employ labor, and a faster flow of goods to feed us all. As an example, most investment in drilling oil and gas wells is financed from the cash flow of extant wells on stream; that is, it is internally financed by recycling capital already in the industry. Each time capital goes into the ground, it makes jobs. Then we must wait until it comes out again to make another round. The longer the wait, the fewer jobs created per decade by each million of capital. Oil and gas owners happen to carry an inventory of proven reserves whose minimum estimated life index is 12 years (and probably ranges much higher), making the job valence of capital here very low. As a corollary, most of the cash flow is property income, not capital recovery.

As another example, we could lower the capital cost of buildings a good deal by shortening their service lives. This might seem like a bad trade, since to reduce the cost by one-third we would reduce the life about two-thirds. But we could then build 50 percent more houses each year with the same capital, increasing the annual service flow by 50 percent. We would increase jobs three times, since each building would be replaced in one-third of the time. This example is highly oversimplified, ignoring maintenance and rehabilitation as alterna-

tives, but gives an idea of how many jobs we destroy by sequestering a nation's capital in forms that pay out slowly.

Long advance inventories and durable flowing capital are not bad in themselves. Deferral of recovery is the bad, and durability is the good that usually accompanies it. The point here is that this good is forced on us beyond our voluntary willingness to pay for it, and part of the cost is involuntary unemployment.

The life span of particular capital items is not to be judged in isolation. Durable capital like that in a barn, a sewing machine, or restaurant furnishings may complement and have a high valence for labor "in parallel," that is, labor applied in using and operating the equipment and short-term investments in maintaining it. And the aggregate capital needs of the overall operation, in a consolidated accounting, may be a modest share, if the material moving through the process is finished and sold quickly.

The point about capital turnover is not that all durability is bad for labor, but that capital that appears to drive labor off the land really does so, even though labor helps produce the capital. And opening new lands, seemingly so favorable to labor, may actually damage labor by pulling capital into forms where it turns more slowly than before and so has a low valence for labor.

Or it may be that an operation uses little labor in parallel with capital but a great deal downstream. Thus pulp mills use more capital per man than sawmills, yet paper requires little downstream capital per man, while lumber needs a lot. Newsprint turns over daily, while lumber in buildings ties up capital for decades. Looking upstream, too, pulp mills use smaller logs, and chips, and so require much less capital in timber than sawmills do. It is the price system that weighs these compensating factors in the same balance and lets us achieve an optimal total deployment and mixture of labor, capital, and resources.

Again, some durable capital may help labor by obviating even more durable capital. Thus utility cores and elevators in high-rise buildings may yield back capital slowly, but they use much less (for the functions performed) than one alternative, that of expanding the city laterally by extending streets and utility lines (they return it faster, too, and with taxes to boot). Also, high-rises help labor by substituting capital for land, releasing a good deal of the latter for other uses.

Of course, there may be still better alternatives in rehabilitating older houses, in low-rise garden apartments, and so on, depending on particulars. The price system is what supplies us with these particulars.

The point is not to regard capital as a threat. Labor needs capital, and labor suffers now from the shortage of capital available to invest where its job-creating efficiency is high. The point is rather to mobilize capital and redeploy it so that its valence for labor is higher. This means making it available to small businesses, especially, and others that combine a little capital with a lot of labor. And this means keeping capital out of sinks and traps.

C. Monuments and Frontiers as Capital Sinks

Among sinks and traps of capital, the worst are monuments, frontiers, and wars. Let us survey these three sinks of capital. By "monuments" I mean things built with one eye on eternity, like the pyramids, and things that resemble them, like many works of governments and of other large organizations, the family seats of the very wealthy, and overmature timber. Many monuments are built to make jobs. The intent is lost in the execution, for monuments soak up a maximum of capital per job created, and yield a minimum of subsistence to advance to labor for the next job.

Public works to make jobs are one of history's great self-defeating, self-deluding, tragic ironies. There is only a one-shot payroll, after which the capital stops recycling for a long time, often forever. One of the great stupidities of all time, surely, was the English effort to relieve the Irish potato famine of 1845–1849 by hiring Irishmen to build roads. A large fraction of the working population, 570,000 men, toiled for the Board of Works, while food prices took off like a bird and half the people died of starvation (Woodham-Smith 1964: 137–160). The people needed subsistence for tomorrow morning, while public policy directed their effort to the next century. An unrecognized self-defeating policy is the most dangerous concept imaginable, for its failure will be taken as a sign that more is needed. Could this be why some civilizations left such amazing tombstones as the pyramids of Egypt, the temples of Angkor Wat and Greece and the Aztecs, the Incan canals, and the famous Roman roads, aqueducts, and public

buildings? It is grand to amaze future archeologists, but not at the cost of destroying a civilization.

The monument-building syndrome has many aspects. Generally, a monument is anything too far ahead of demand. A great deal of heavy construction and civil engineering is monumental because tax-financed and tax-free. Advance extensions of transport-utility networks, sized for anticipated higher future needs, show monumental proclivities. They are often financed by cross-subsidy from the central system, and calculated to maintain the rate base, and/or internalize the profits. Excess capacity is often monumental, unless geared to reasonable forecasts of early need.

Monumental excess capacity results from the use of capital as the ante in some of life's poker games, where it is used to claim quotas: a share in a cartel, a water right, a bank charter, an air route, an oil lease, or what have you. "Buying business" is the current phrase for it. Inventories of extractive resources are commonly excessive for a complex of reasons (Gaffney 1967a).

"Master plans" and "fully integrated development" are usually monumental, unless carefully staged; splendid examples are the California Water Plan, the California highway system, the U.S. Interstate Highway System, and the sterile city of Brasilia. "Internalizing externalities," "economies of scale," "planning for future expansion," and "foresight" are excellent catchwords for monument builders. Meanwhile, life is what happens while we are making other plans, and obsolescence is what happens to big plans under construction or soon after. Governments, world banks, and Wall Street all tend to favor monuments for their publicity and promotional value. Hothouse "regional development," often promoted by local unions and contractors seeking jobs, has all the monumental traits. The headquarters and towers of large public and private organizations of every description tend toward the monumental, as do many of their other works. Every large organization seeks to internalize profits and keep the capital under control of the management.

Turning to "frontiers," gaining access to land via conquest and expansion is the imperialistic variation of Henry George's observation that labor applied to marginal land creates poverty. There is some truth in the old idea of the frontier as a safety valve for labor, but a

generation of revisionist economic historians now has established that the frontier attracted more than its quota of capital per man, much of it prematurely. This led to recurrent crises of capital shortage in the 19th century. We tap frontiers by building monuments like the canals of the 1830s, the premature western railroads, and the dams of the Army Corps of Engineers. The payout from much developmental infrastructure capital comes in the form of increased land values. But to private owners this increment is income, most of which is normally consumed. Thus the capital is dissipated.

Frontiers of science and research and invention are another Lorelei for capital. As Boulding has rhymed,³⁷ they yield “benefits hereafter.” These are tax exempt because the capital cost is expensable. Yoram Barzel (1968) has shown that the patent system, too, hyperactivates research in the same way that an open range overstimulates grazing. Research in subsidized agriculture experiment stations has gotten decades out ahead of dissemination and application. We need to embody more quickly in real capital what we already know, and adapt it more frequently to changing needs and scarcities, prices and costs, by replacing capital faster.

The energy frontier—including investments in alternative energy sources—is the current vogue. Incredible figures like \$1 trillion are tossed off as capital “requirements” of pipelines, drilling, solar energy farms, tankers, ports, and so on, requirements that will obviously never be met because the capital does not exist or cannot be spared and will not be saved. As a broad generalization, where we use capital to substitute for land, or open frontiers, the capital is very durable. It lies in close with land and resembles it and takes on some of its durability. Wicksell (1954: 105) called such objects “rent-goods” because they so resemble land. Examples are surveying and exploring, cuts and fills, drainage, leveling, clearance, foundations, pipes, tiles, wells, pits, shafts, canals, tunnels, bridges, dams, and roadbeds. The permanence of land warrants building long life into capital that develops it. The rise of land values converts flowing into growing capital.

The upper levels of skyscrapers are also land substitutes of long life and high capital input. While intensive improvement of the best sites is generally desirable on balance all around, we suffer today from uneven improvement of sites, that is, high-rise sprawl or scattered

hyperintensification. This pattern is more capital-using, as a total system, than more uniform improvements at moderate densities.

Frontier governments often go overboard competing for seed capital. They put a high value on immediate payrolls from construction—an aspect of their high time-preference. They give away too much to get it: tax holidays, de facto pollution easements, resource leases on giveaway terms, land grants, charters, franchises, special services, and so on. These nonmarket fillips pull capital into premature and marginal development on frontiers. The form of the lure for capital, like borrowing a city's credit, often prompts excessively capital-intensive forms of investment. Granting pollution easements lowers the capacity of surrounding land to house labor and attract people generally. During a boom, frontiers drain capital from older centers without doing much obvious immediate damage, but when it is time, as now, to renew the older centers, the frontiers do not return the capital. They demand more and more, having fallen into the seed-capital fallacy initially.

Subsidies to tap frontiers make land artificially abundant. This is supposed to help make outlets for labor, and in some ways does. But frontiering taps new land at the cost of sequestering capital. Frontiers soak up scarce capital and hold it so that it stops cycling and creating payrolls. Abundant land can still be badly used, and centuries of Caucasian expansion in the New World in a futile flight from unemployment have shown that frontiers are not enough. Labor does not need great reservoirs of underused land so much as pressure to use the land we already have, and working capital to help labor use it.

The third great sink of capital is war, and the policies of mercantilism and imperialism that attend it. War combines the frontier fallacy and the public works syndrome and the waste-makes-jobs doctrine into a claim on the national treasure that can become greatly inflated above the simple cost of police protection. It costs money to win land—and one does not always win. Someone, indeed, always loses. Policing marginal outposts after they are supposedly “won” can be a continuing drain, as in Japan, Korea, Berlin, Israel, or Iraq. If and when land is won and secured, finally, the net benefits of the whole military outlay often accrue to a very few large owners of the land in question, as in California and Hawaii, or to foreign potentates like

Mohammed Reza Pahlevi (the former Shah of Iran) or King Faisal who turn around and exploit us and drain us of more capital, or to multinationals that reinvest mainly abroad and bed down with the foreign potentates. Imperialism has generally been an economic catastrophe for most of the players for the benefit of a few.

To keep capital from wasting into those sinks calls for massive institutional and attitudinal changes. Attitudes are surprisingly adaptable, and we see evidence on every hand of eagerness to adapt life styles to scarcity, even in advance of need. Institutions are something else. They are the stubborn rear guard, shutting out the signals of the times and resisting our efforts to budge them. But this, too, will pass in the coming time of troubles, as the lag of institutions behind current needs creates overpowering tensions.

D. The Role of Taxes

Here, we focus on tax policy. The question is, are we prepared, once the rear guards yield, to budge tax policy in the right directions? Rule One is to retain and strengthen the price system as much as possible, and be wary of rules couched in other terms. The price mechanism is the only way we have of treating the economy as a total system and applying rules consistently in the same measure throughout.

The best tax on all counts is the part of the property tax that falls on land values. The part that falls on capital is far from the worst tax. It is the surest way to tax capital without favoring longer lives over shorter. So we should make greater use of the property tax at the same time as we increase the share of it that falls on land. The property tax on holding land presses landholders to use the land. This employs labor and produces goods and services. It also abates the pressure to waste precious capital developing new lands. The land tax pressure should be applied with greatest force to land already serviced by extant underutilized capital.

There is a hard choice to make when we know that some extant public works, roads, and lines are badly placed in terms of long-run good planning. The choice has to hinge on particulars. Today one overriding particular is the crisis of capital shortage, and the choice should often go to pressing into use land presently serviced. As there

is a surplus, however, we have some choices and can begin immediately an orderly retreat from the most remote submarginal extensions and outposts. But infilling of some good land bypassed by public works may now wait a while until capital is cheaper.

Optimal infill calls for land assessments more influenced by near than far future income. But then, high interest rates that signal capital shortage will push market values that way anyway. There is a lot to be said for having assessors simply follow that most useful of pilots, the market. Added revenues from land taxes should be used to lower other taxes. But the property tax on buildings should not be the first to go. It is the only tax based on capital standing still instead of moving. It serves much like an increase in the rate of interest, to steer capital into forms cycling more quickly, with higher valence for labor. Realization or liquidation of capital, the base for income and excise taxes, is what feeds us as consumers and employs us as workers. Passive investment, the base for the property tax, employs no one.

We must prepare to accept the decline in investments of high capital intensity that a less-biased tax system would cause. For that is the whole point, to spare scarce capital and release it for higher uses. Even overmature trees, a form of extravagant monument revered by many otherwise thrifty and ascetic outdoorspersons, must yield, although it consoles some to note that capital shortage also dictates using more labor on each log after cutting, and fewer logs in each house.

The first taxes to cut are payroll taxes. The major payroll tax is the personal income tax on earned income (wages and salaries). How far to carry this gets into value judgments beyond our present scope, but some first steps are clear enough. We should forget about revenue sharing, which substitutes federal payroll and other activity-based taxes for local property taxes. This taxes labor to relieve property. Federal grants to local people should go to persons, not governments, and what better way to do this than lower the personal income tax on earned income?

Among other benefits, the shift from area-based grants to person-based transfers would help make localities more hospitable toward workers as residents. Currently, central government taxes individuals to subsidize local governments, which turn around and zone out poor individuals because their disposable after-tax income is so low they

might dilute local property tax bases. Ideally, central governments would relate to individuals as their net benefactors instead, and localities would compete to attract persons. Lowering payroll taxes increases the incentive both to work and to hire, and a secure employed worker would be as good a neighbor as one usually finds.

We should decline current proposals to widen income tax loopholes for property. This can only shove more of a burden onto payrolls and make our income tax resemble more that of England, the sick man of Europe.³⁸

Labor is supposed to benefit from *greater investment*, but our analysis has shown that labor needs *faster reinvestment*. Ignoring this central truth is one of the truly great and damaging economic fallacies, leading us to think we must spoil capital to employ labor. It is, rather, payroll taxes that slow down reinvestment, by making labor look artificially dear to employers and motivating them to substitute capital and land for it. Special tax favors for capital almost all favor deepening capital and slowing reinvestment. The only exception would be the investment tax credit, if stripped of the present sliding scale.

Instead, we should plug the loopholes for land and capital so that we can lower the tax rate, relieving payrolls. It would be a good idea to reinstate a generous lower rate on earned income as well, for we will be a long time plugging a hundred clever loopholes, some subtle and others complex beyond easy reform.

We should remove biases that favor long over short investments. It is too much to expect that we could tax accruals and imputed income annually, as the Haig-Simons logic would have it, and the more workable alternative is to strengthen the property tax, which reaches the same end by a different route. But we could remove all explicit biases granting lower rates to longer investments. Capital gains treatment is the greatest of these, with all it implies, and we could also do away with all the sliding scales that apply higher rates against shorter investments. Although we cannot easily tax appreciation other than by the property tax, we can and do deduct depreciation, and a neutral tax policy here will key tax depreciation to real asset value depreciation, removing biases against shorter-lived capital. Having turned the personal income tax back into a tax that includes property income, we could abate the corporate income tax, with its powerful bias for

internalizing new capital. A progressive corporate rate would break up the largest corporations, which, as we have seen, employ the fewest workers per unit of capital, and become "too big to fail." Undistributed profits should be taxable to stockholders on the same basis as dividends.

Public works are major sinks of capital. They need to pay property and income taxes, and the agencies in charge should show these in the budget, if only as shadow costs, along with interest at full market rates. Here we need tread carefully, remembering the logic of marginal cost pricing, and remembering that the right works in the right place, like subways in New York, can save much more capital than they consume. Let us look last to the subway for revenue, and first to the capital and land in highways, cars, trucks, terminals, gas stations, parking lots, garages, refineries, and car lots.

A decreasing-cost distribution system should be priced to yield a deficit because a price based on marginal cost cannot cover fixed costs. The value of service at the low price is imputed to the land served, and that is the proper tax base. The deficit-yielding subsystem has no value and should pay no property tax, but receive a subsidy. This is the principle of "marginal-cost pricing." That is a good principle in its place, but it is hard to keep it there. Cross-subsidies and submarginal extensions become the rule, wasting capital. Here the solution is user charges, especially peak pricing and area rates, which force users to economize on the capital and serve as substitutes for excess capacity. Fortunately, there is a wide literature on this subject to supplement these spare and summary words.

Another needed change is the tax treatment of income from offshore. We cannot suddenly create much new capital, but we can summon back a great mass of it now lost to us offshore by removing the egregious special loopholes for U.S. capital invested abroad.

These are some steps toward a tax system less biased for monuments and frontiers, more geared to help make jobs by mobilizing and activating wealth. If we do this, and like the results, we can go further. Meantime, these steps represent substantial progress. They will help us find full employment on our present land base, permanently, freed from the compulsion to grow and expand that we inherited from generations of ancestors who had not yet

learned the finite limits of the Earth. We can continue to create capital, and we can apply new ideas more quickly than now as faster replacement lets us embody new techniques in capital in a shorter time. Thus we can grow in every good sense by substituting real progress for the random lateral expansion of the past. We can find full employment in peaceful labor on our share of this small planet and, doing so, drop the burden of imperialism that may otherwise destroy us.

Notes

1. Since land is not depreciable, these tax preferences theoretically do not apply to land income. In practice, however, land income is as sheltered as capital income. See Gaffney (1970a: 405–415). Mainstream macroeconomists have not been at all alert to this problem.

2. They are simply financed with owned instead of borrowed capital. The relevant “term” is how long the capital sunk is tied up before being fully recovered. “Recovery” is the residual after deducting interest from cash or service flow, and may be very slow and even negative when interest rates are high and cash flow low.

3. If the interest rate on the mortgage is only 4 percent, the proportion of the total cost paid in interest falls from 75 percent to 57 percent. If the interest rate rises to 10 percent, it rises to 80 percent.

4. A full accounting of the capital value of a tree would have to consider the stream of ecological benefits it provides while it is growing, particularly in the form of the offsite benefits of preventing downstream flooding. As important as those spillover benefits are, they take us away from the central point of this discussion—the effects on labor of capital investment.

5. A more correct analysis would take into account the return to the land on which the trees are growing. Since timber grows on relatively marginal land with few alternative uses, the rent is low. For the initial capital investment of \$100, the land under those trees might be \$5 per year, and the future value of those payments in 63 years (at 8 percent) would be \$7,900. Thus, the return to land could be as great or greater than the return to capital. For now, however, the point is simply that labor receives little.

6. As Scherer (2008: 1) reports: “For every \$1 billion in government infrastructure spending, 28,000 new jobs are created, according to a federal study quoted by Kenneth Simonson, chief economist at the Associated General Contractors of America. But only about 25 percent of those jobs are for construction workers. Another 25 percent are supplying industries, such as for concrete or lumber. The rest are jobs like retail and others created indirectly because workers are spending money.”

7. The sheep were capital in exactly the same sense that trees are: they are assets that ripen in value over time, depreciate, and require maintenance. In contrast to trees, sheep provide an economic service annually after an initial period.

8. An assault within the economics profession on the assumption that capital is homogeneous was launched decades ago by Pierro Sraffa and Joan Robinson, leading to very technical and abstract debates, without clear practical implications. Nevertheless, Paul Samuelson and other neo-classical economists conceded that their models of capital were faulty and that measures of capital intensity are necessarily ambiguous (and involve some amount of circular reasoning). These debates did not, however, influence mainstream economic thinking in the United States. As one recent summary explains: "In the United States, . . . mainstream economics goes on as if the controversy had never occurred. Macroeconomics textbooks discuss 'capital' as if it were a well-defined concept—which it is not, except in a very special one-capital-good world (or under other unrealistically restrictive conditions). The problems of heterogeneous capital goods have also been ignored in the 'rational expectations revolution' and in virtually all econometric work" (Burmeister 2000: 310). For our purposes, the relevance of the controversy is that American macroeconomic theory has simply assumed away all of the differences in capital intensity associated with alternative factor mixes, so that the issues being raised here have been entirely ignored.

9. The growth model developed by Robert Solow posits technological change as the factor needed to overcome the diminishing returns associated with additions to the capital stock per worker. In effect, this means more capital per worker is needed just to stay in place, which reinforced the bias in favor of capital intensity that was already present in the Harrod-Domar model.

10. There was a lengthy debate in the 1980s as to whether rising energy prices would cause demand for capital to rise (if they are substitutes) or fall (if they are complements). Inconsistent statistical results fueled the debate until improved statistical techniques resolved the question on the side of substitutability. For a discussion of three different statistical measures of elasticity of substitution, see Chambers (1988) and Thompson and Taylor (1995).

11. An older, perceptive treatment is Rose (1974).

12. Gaffney (1976b: Appendix 3) explains mathematically the separate effects of labor and capital inputs. The result can be described intuitively as follows. If the capital invested on land depreciates quickly and must be renewed every two or three years, labor-demanding production processes will be chosen over low-intensity uses. But if the tax system encourages capital investment, labor will be displaced. This is particularly true of capital with a

long payout period, where the durable investment locks land into a single use for a long period, and labor will be largely displaced from that land over the life of the investment.

13. Of course, the return to land from tomatoes is highly leveraged and volatile as a short-run gamble, but that is not our concern here. We are averaging out the good years and the bad.

14. The irrigable acreage is from California Department of Water Resources, Division of Planning and Local Assistance (2001). Crop acreage is from U.S. Department of Agriculture, National Agricultural Statistics Service, California Field Office (2005: 1). There were, in 2004–2005, around 800,000 acres in grapes, 550,000 acres in almonds, 300,000 in other nuts, 240,000 in citrus fruit, and about 300,000 in various other fruits and nuts.

15. We have drawn data from 1964 because the data in more recent years did not include the number of employees in each firm. There is no reason to assume that the relationships we are investigating here between capital and labor have changed over time.

16. An example of such thinking, unrelieved by any apparent doubt of its adequacy, is Hickman (1965). Nor could I name any Brookings economist who takes a different view. Close to power and the application of economic ideas to policy, Brookings plays a central role in defining the orthodoxy that has dominated policy to date.

17. In general the CRF is $i / [1 - e^{-ni}]$, where i is the interest rate, n is the number of years, and e is the base of the natural exponential function. If $i = 0.07$ and $n = 10$, then $CRF = 0.139$. That calculation is slightly different from the one actually used in accounting, however, because it assumes continuous, instantaneous interest calculations. If interest is computed on the remaining principal once a year, the CRF is 0.142.

18. The same wage shares apply if investments are “normalized” by staggering purchases and retirements over time. If new harvesters are produced and old ones retired at a constant rate, say, one a year, there must be 10 units out bearing interest for every work crew making a new one. The share of labor in the income falls as the capital pays off more slowly, with the wage share the same as for an individual harvester.

19. A mathematical treatment of the way land rent and the life cycle of capital influences the ratio of labor to capital can be found in Gaffney (1976b: 153–158).

20. Conversely, a *decrease* in unit labor cost to employers leverages an increase in property income with a nine to one multiplier. So, 1 percent off labor cost adds 9 percent to property income, drawing new investment into labor-using enterprise in the most compelling way.

21. The arguments about who bears the tax burden have nothing to do with who directly pays the government. The issue is whether the tax on work affects hours of work. If it does, then employers have to raise wages to attract

workers, meaning that part of the final burden falls on business. If taxes on work do not influence work behavior, then the tax falls entirely on workers, including the half of the payroll tax currently contributed by employers. If taxes do not affect willingness to work, then employers can reduce wages by enough to compensate for the payroll tax they pay. The marginal tax rate of 30 percent that I have posited in the text is based on the assumption that workers end up paying 100 percent of the payroll and income tax. That would occur only if wage earners work as many hours per week regardless of the size of their take-home paychecks, so employers do not have to pay higher wages to compensate for the taxes they take out. However, if wage taxes discourage work at the margin (overtime, second jobs), then part of the cost of those taxes is borne by employers. Most business owners already take this for granted.

22. The U.S. Chamber of Commerce reports that benefits are 39 percent of payroll costs, of which 11 percent are from health insurance, 10 percent are compensation for time off, and retirement and savings plans are 8 percent (Taub 2003). Median health insurance costs per worker covered rose 62 percent between 1999 and 2005, according to a study by the Henry J. Kaiser Family Foundation (2008), which is based on U.S. Bureau of Labor Statistics data from the National Compensation Survey, 1999–2005.

23. Interest earned by pension funds is tax-deferrable, but that helps the pensioner as a capitalist, not as a worker. Some pension plan deductions (like those of the state of Wisconsin) are not tax-deferrable—the worker pays tax on unrealized income, even though property does not.

24. There is a wide literature on this, including Holland (1969).

25. Before World War II, salaries paid by state and local governments were free of federal income tax. Then salaries became taxable, while the cost of hiring capital remained exempt.

26. See Forbes (1965: 27), showing how housing builders can expense water supply systems. William Condrell, writing in the *Timber Tax Journal*, October 1970, also discusses how Section 175 of the Internal Revenue Code lets “farmers” expense soil and water conservation, and Section 182 lets them expense land clearing.

27. Via defaulting on nonrecourse loans. See Forbes (1974: 40–41).

28. “Combining with capital” refers to producing durable improvements. These might be for personal use or for later resale with capital gains treatment. Both are common.

29. An exception may be poultry. That is, however, very unusual. It is part of a general bias for agriculture inherent in cash basis accounting allowed for livestock.

30. There are several points in tax law, besides those already noted, in which excess depreciation is recaptured using a sliding scale where the amount recaptured declines with the number of years before sale.

31. Liquor, of course, is highly taxed outside the income tax, by excises, but the excise tax levied upon sale has a bias for longevity, and greatly favors Scotch, maturing in 10 years, over vodka, which can age in the bottle in as little as 10 days.

32. Bartlett (2009) describes the way the indexing debate has fared in recent decades: "For many years, economists have advocated indexing capital gains for inflation so that taxes would apply only to real gains. . . . Rather than adopt inflation indexing for capital gains, Congress has generally allowed a lower rate on capital gains than that on ordinary income. . . . During the George H. W. Bush administration . . . the Treasury Department [tried] to bypass Congress and institute indexing of capital gains for inflation using its regulatory power, [but] . . . the Justice Department issued a legal opinion saying that this was not possible. Since then, the issue of indexing mostly died, with Republicans concentrating their efforts on cutting the tax rate on capital gains to its present level of 15 percent."

33. He credited it to Böhm-Bawerk, who, however, expounded it very roundaboutly, if not obscurely.

34. 7.273 years, to be more exact.

35. Instead of $K = FP$, the proper formula is now $K = (F(e^{pi-1})) / i$, which is greater than FP .

36. In practice, "investment" is used very loosely by macroeconomists for spending on durables, without careful distinctions of net and gross, as the logic would require. No careful effort at all is made to estimate real depreciation, the problem being buried by using GNP instead of national income.

37. In modern industry, Research
Has become a kind of church
Where rubber-aproned acolytes
Perform the ceremonial rites
And firms spend funds they do not hafter
In hope of benefits hereafter.

—K. Boulding

38. Ironically, the data come from Joel Barlow (1973: 432–433) of Covington and Burling that British taxes bear more lightly on capital than do those of other major capitalist nations.

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