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ABSTRACT

What are the unskilled labor intensities of various commodities and services in America? Who, then, place the heaviest demand on the services of America's working poor? This paper is organized around these two questions. The mode of analysis is conventional: the open, static input-ouput model. Stocks of capital goods are not linked to capital goods production but rather, new capital goods and consumer goods expenditures are treated as components of exogenous final demands. Our purpose is to derive the direct and indirect resource requirements to deliver alternative bills of final demand, but resource requirements are explored in one dimension only-unskilled labor. After supplying estimates for the early 1960s, the paper explores the following demand mix issues which are relevant to factor-demand explanations of American inequality experience: (i) pre-fisc vs. post-fisc; (ii) Engel effects, redistribution and growth; (iii) capital goods production, technological progress and accumulation; and (iv) human capital production and the accumulation process. The paper then concludes with an evaluation of the temporal constancy of our findings by performing similar calculations on 1919 and 1939.

CONTENTS

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1. Demand and Distribution: Macroeconomic Issues

In spite of the high stakes and the large number of academic players, twentieth century American distribution performance has presented a challenge to economists which has yet to be answered. The facts are clear enough (Williamson, 1975; Lindert and Williamson, 1976): wars and business cycles aside, America has undergone three extraordinary phases of macro-inequality experience. The first phase contains three decades of trending inequality terminating with 1929. The thirteen years from 1916 to 1929 appear to be a watershed, marking peak inequality levels in American history, but this plateau was preceded by a notable surge in all available inequality indicators. An index of the income share returned to unskilled labor-the "working poor"-falls from 34.8 to 26.8 percent during the decade following the turn of the century, and by 1916 the index had reached an all time low of 23.7 percent. While the working poor saw their share in national income rapidly erode, numbers in poverty actually rose from 32 to 35 percent over the decade. Other statistics confirm this inequality surge since following 1896 occupational pay differentials, the premia on skills, and the property income share all trace out the upward drift. The second phase has received far more attention, although little analytical resolution. It is generally agreed that a "revolutionary" egalitarian trend took place from 1929 to the end of World War II. The "revolutionary" levelling is sufficiently well

known to make further documentation redundant, but a reminder of the quantitative dimensions might be useful. The share in pretax income of the top five percent declined from 0.264 to 0.176 over these two decades of unusual social turbulence. While the real wage of the low income urban unskilled rose at the remarkable rate of almost 2.5 percent per annum, the wages share of the "working poor" increased from 19.8 to 33.0 percent by 1948 (Williamson, 1975, Table 1, p. 6), and, as a result, the percent in poverty almost halved. These trends were sufficiently dramatic to be reflected in all size distribution statistics regardless of the income or recipient concept used. The third phase covers the three postwar decades. Perhaps the most curious episode of all, the recent experience has been one of remarkable long run macro-distribution stability. Although researchers may appear to disagree (Henle, 1972; Budd, 1970; Schultz, 1971; Chiswick and Mincer, 1972; Reynolds and Smolensky, 1975), debate over choice of time period, the relevance of demographic adjustment, the most appropriate income concept, and choice of income recipient unit all simply confirm that the distribution of income has been very stable in full employment years since the late 1940s.

How are these three phases to be explained? Can economists continue to advocate various distributive policies while ignorant of the underlying sources of American twentieth century inequality trends? Obviously, the present writer thinks not.

Hypotheses regarding macrodistribution performance can be classified as either factor demand or factor supply related. The factor supply thesis has always been popular. For example, inequality

trends in the post World War II years coincide with a rapidly expanding supply of low skill labor, such as women and teenagers. It seems plausible, therefore, to assign the leading role to demographically induced factor supply forces (Schultz, 1971) in accounting for the postwar interruption of trending equality initiated in 1929. The earliest and most verbal adherents to the unskilled-labor-supply thesis, however, can be found among those few analysts interested in American long term inequality experience prior to 1948. It has long been apparent, for example, that the peak spread in the wage structure on the eve of World War I coincided with a peak inflow of unskilled "new" European immigrants. Labor economists like Ober (1948), Reder (1955), and Keat (1960) have, therefore, argued that the reversal in American immigration policy must have accounted for a large portion of the subsequent narrowing in the wage structure. It is but a small step from the labor economist's limited concern with wage structure to the larger issues of macrodistribution performance. Lindert (1974) takes that step when asserting that demographic forces can explain the vast majority of American macrodistribution experience since the turn of the century. Some years ago, Kindleberger (1967) applied a similar thesis to postwar Europe, while Lewis' (1954) "labor surplus model" is now the conventional mode of analysis among contemporary low income economies.

No doubt rapid growth in the stock of low skill workers tends to depress their real earnings. No doubt scarcity of the college educated tends to raise their relative price too. Nonetheless, these secular demographic-factor-supply forces have always been reinforced, and often dominated, by systematic long term economic-and-technological-

factor-demand forces (Dresch, 1975; Williamson, 1975). These factor-demand conditions are much more difficult to isolate, perhaps explaining their relative absence from the literature.[1] Obviously, a decline in the relative demand for the services of the working poor can be induced either by a rapid diminution in unskilled-labor requirements (compared with skills, training, schooling, machines, and land) per unit of value added everywhere in the economy, by the relative contraction of activities utilizing unskilled labor intensively, or by some combination of the two. The present paper will supply evidence on the second of these possibilities.

What, then, are the unskilled labor intensities of various commodities and services in America? Who places the heaviest demand on the services of America's working poor? The paper is organized around those two questions. The next section explores four alternative sources of shifting factor demand mix which are potential candidates in accounting for America's long run experience with income distribution since the turn of the century. Section 3 presents estimates of 1963 unskilled labor intensities for 79 sectors. As with Anne Carter's (1970) recent work, indirect unskilled labor content is included in the calculation, but contrasts in concept make explicit comparisons with Carter's results difficult. Section 4 utilizes these estimates to explore the demand mix hypotheses raised in Section 2. The remainder of the paper explores the historical stability of the relationships uncovered for the 1960s.

2. Demand Mix and the Political Economy of Growth

Employment creation as a means to achieve increased equity is hardly a new idea, but it does motivate this paper. Yet it is not the

impact of aggregate demand that requires more attention, but rather the mix of a given level of aggregate demand. In the economic development literature this is called the "output composition" problem, and most experts feel that it is far more important than the issues of technique choice or factor-saving bias. Since foreign trade is such a small component of American output, the scope for shifts in derived factor demand is limited by the structure of domestic demand. What, then, are some major influences on the structure of domestic demand which might account for America's inequality performance?

2.1 Pre Fisc and Post Fisc

The theory of tax and expenditure incidence is sufficiently well developed to have produced frequent attempts to estimate "post fisc" distributions-that is, size distributions which appear after government taxation and expenditures have been allocated statistically to "pre fisc" nominal income distributions. One of the best of these is a recent paper by Reynolds and Smolensky (1975). Their calculations show that the revenue and expenditure system does indeed reduce inequality significantly, an expected result, perhaps, since "public output is more equally distributed than private output" (Reynolds and Smolensky, 1975, p. 2). Indeed, the key to the more equitable 1970 post fisc distribution is not the tax structure, since it is insufficiently progressive to account for more than a trivial component of the difference in Gini Coefficients pre fisc, .400, and post fisc, .290 (Reynolds and Smolensky, 1975, p. 13). The lions' share of the pre-post fisc difference in Gini Coefficients is about equally accounted for by transfer payments and government expenditures.

The weakness in this approach, of course, is its partial equilibrium nature. Nowhere is there a general equilibrium calculation which explores the impact of government expenditures on the pre fisc distribution itself. Surely it seems reasonable to expect that government and private expenditures on goods and services imply very different relative demands for skills, for land, for physical captial and for the services of the working poor, relatively unskilled individuals with limited asset endowments. Perhaps the correspondence between the income levelling from 1929 to 1948, on the one hand, and the rise in governments' expenditure share in gross national product, on the other, is more than sheer coincidence. Peter Lindert (1974, p. 55) states the hypothesis positively:

> "If it could be shown that the government's purchase of goods and services create a much greater demand for. . . unskilled labor, than the same amount of displaced private demand, then the rise of government has been a levelling influence on incomes even aside from its effects on. . . aggregate demand, and the progressivity of taxation."

While discussing the pretax inequality trends in America since the early 1960s, Reynolds and Smolensky (1975) imply the competing hypothesis:

> ". . .we do not claim. . .that the 1970 fisc has offset a widening of the distribution of money income since 1961 because the fisc may have indirectly contributed to the widening" (pp. 21-22, italics ours).

Section 4 will attempt to discriminate between these competing hypothesis, at least as they apply to the relative economic position of the working poor.

2.2 Engel Effects, Redistribution and Growth

The fashionable claim in the economic development literature is that redistribution from rich to poor is likely to increase the employment

of the poor, and thus strengthen the impact of the first round transfer itself (Morawetz, 1974, pp. 505-506). With very few exceptions, empirical studies from these countries appear to confirm that the consumption basket of the poor is more intensive in unskilled labor than that of the rich.[2] One obvious explanation for this result is that the poor consume agricultural products intensively, and in low income societies agricultural technologies are intensive in unskilled labor. Neither of these two conditions hold with nearly the same strength in America, and thus it seems relevant to test this hypothesis on American data.

Are wage goods labor intensive? The implications are of staggering importance. First, a redistributive tax-transfer policy may be self-defeating if the rich consume goods intensive in the services of the working poor. If, on the other hand, the poor are heavy consumers of their own labor, then redistributive tax-transfer policy will have an egalitarian influence on the pre fisc distribution itself Second, a tax-transfer policy which favors investment but causes aggregate consumption to contract (as most do) may have an important anti-egalitarian influence if consumption goods tend to be more intensive in unskilled labor. Third, the "rise in government" from 1929 to 1948 may have had an impact on distribution trends beyond the private-public expenditure mix impact discussed above in Section 2.1. To the extent that expenditure patterns in the private sector itself were distorted, an additional influence on pre fisc incomes may have been present.

Thus far we have focused on redistribution. Yet, Engel effects can obviously have a long run influence even in the absence of any

redistributive schemes. Regardless of the endogenous forces generating income growth economy-wide, how do consumption patterns respond to secular growth? Food expenditure shares decline, of course, thus diminishing the relative demand for unskilled labor. But surely the influences are more complex. What about the demand for services, as well as the composition of non-food commodity consumption? Does the accelerated secular decline of the rural population share since the 1920s matter? Do rural and small town expenditure patterns differ sufficiently from urban to have a marked influence on the derived demand for unskilled labor as urbanization procedes?

The "old stagnationists" drew intensively on the experience of the 1920s and 1930s when developing their models of capitalist instability, stagnation and crisis. Increased inequality and higher profit shares went hand in hand, aggregate consumption suffered and eventually a crisis in aggregate demand emerged. The "modern stagnationists" are considerably more sophisticated and appeal primarily to post World War II Latin America for their evidence. Their sophistication lies in a shift in emphasis from the aggregate demand for "labor" and overt unemployment, to expenditure mix and the derived demand for unskilled labor. For them, once increased inequality emerges it will increase without bounds until checked by violent revolution. The key hypothesis in their models is that the rich consume products intensive in skills, capital and land: the working poor are caught in an explosive contraction in demands for their services.

Quantitative test of the "modern stagnationist" hypothesis is clearly important in the formulation of American policy. It may imply an endogenous explosive influence accounting for inequality

cycles associated with American economic instability (Metcalf, 1972) since the late 1940s.

2.3 Capital Goods, Technological Progress and Accumulation

In the 1960s, two-sector growth theories taught us the analytical relevance of comparative factor intensity. Uzawa (1961), for example, found that a sufficient condition for uniqueness of static equilibrium was that the capital goods sector must be less capital intensive than the consumption goods sector. In spite of the empirical work by Gordon (1961) and others, the assumption has always seemed very artificial, especially since skills have rarely been treated adequately either in theory or in empirical application. On these grounds alone it seems relevant to ask whether capital goods are less intensive in the services of the working poor than consumption goods. Or, more generally, are consumer and producer durables less intensive in unskilled labor? Apart from the fact that the empirical evidence brought to bear on the issue was never very convincing, there are other reasons that motivate the enquiry here. Commodity output mix has continued to shift in favor of durables and service mix has continued to shift in favor of human capital formation activities (e.g., education and medical care): What have been the distributional implications?

Kendrick (1961, 1973), Carter (1970) and others have documented a high inverse correlation between sectoral price changes and total factor productivity performance. Thus, the output price structure appears to be determined primarily by the wide variance in total factor productivity performance by sector. Nowhere can this be seen

more vividly than in the price and output performance of durables and nondurables. Producers have continually raised the share of producer durables in gross fixed capital formation. Consumers have done the same, raising their share of expenditures committed to consumer durables, and this latter force is independent of income effects since we see it happening at all income levels. Clearly, the relative decline in durable goods' (quality adjusted) prices encourages accumulation by firms and households economywide.

The important point, however, is that the rate of durables accumulation has never been stable in the twentieth century, nor has the rate of decline in durables' relative prices, nor for that matter has the relative rate of total factor productivity growth in durable goods producing sectors. Is it sheer coincidence that the episode of income levelling from 1929 to 1948 also exhibits the most sluggish rate of output shift in favor of durables? In 1958 dollars, producers' and consumers' durables as a share in total private expenditures rose modestly from 16.1 to 19.2 percent over the nineteen years following 1929. The figure for 1973 was 26.6 percent, reflecting a near doubling in the annual rate of shift into durables.[3] Here again we have another potential explanation for America's long term distribution performance which appeals to demand mix.

2.4 Human Capital and the Accumulation Process

Within the service sector itself, both public and private expenditures on health and medical care grew at unusually rapid rates from the late 1940s onwards. Are these human-capital-creating industries relatively intensive in the services of the working poor? Do they

differ in this regard from the more conventional (durable) goods' production? What are the distribution implications of the twentieth century shift into human capital as the more dominant form of accumulation and investment?

3. The Unskilled Labor Content of Commodities

Our mode of analysis is conventional: the open, static input-output model. Stocks of capital goods are not linked to capital goods production but rather new capital goods and consumer goods expenditures are treated as components of exogenous final demands. Heterogeneous labor, capital, and land are also taken as exogenous endowments. Our general purpose is to derive the primary direct and indirect resource requirements to deliver alternative bills of final demand. More specifically, we wish to explore the resource requirements in one dimension only, unskilled labor. After all, the unskilled constitute the vast majority of the working poor and it is the latter which interests us rather than the whole size distribution.

Our approach will contrast with the work of Carter (1970) and others in two dimensions: (i) "Labor intensities" are measured as wage costs per dollar of output. The use of cost shares, rather than physical man hours per dollar of output, better conforms with our interest in distribution as opposed to production relationships per se; (ii) "Labor " is restricted solely to the unskilled, and thus only the unskilled wage cost component of total payments is considered.

How then do we measure the unskilled wages share, or "raw" labor intensity, by industry? We appeal to the well developed postulates

of human capital theory at this point. Following Chiswick (1974), Mincer (1974) and others, we could have estimated earnings functions from cross-section data and utilized the intercept in

$$[1] \quad Y_{N\ell} = w \prod_{\ell=1}^{N} (1 + r_\ell k_\ell)$$

where $Y_{N\ell}$ are gross wage earnings in the ℓth period after N periods of on-the-job training, formal schooling, and other modes of human capital creation. The annual reinvestment rate of earnings into human capital formation is k_ℓ, r_ℓ is his average rate of return on that investment, while w is his full years' earnings had he received no training. The latter may result, of course, because he is too young ($\ell = 0$), because the rate of return to training and skills is zero (an unlikely case) or because his reinvestment rate has been close to zero. In any case, the resulting estimated intercept, $\hat{w}$, from the logarithm-of-earnings regression would indeed be an unambiguous estimate of "raw" labor's annual rental price. Obviously, shifts in that intercept estimated from cross-sections drawn from various points during a decade would reflect changes in the equilibrium wage over time. Very few members of the American labor force are restricted to the abysmal state of no human capital at all, of course. Yet the working poor do have the lowest human capital component, e.g. $(w/Y_{N\ell})$ is maximized, and thus, they come closest to fulfilling the requirement. The human capital component of earnings is simply the residual, $Y_{N\ell} - w$, and an expansion of the expression to include all sources of income could easily yield the total "non-raw-labor" component of income. What is true for the individual or the household is also true for the firm. To compute the unskilled wages content of total costs (per unit

of output), simply perform the calculation

$$[2] \quad \Theta_j(t) = \frac{\hat{w}L_j(t)}{C_j(t)} \quad ,$$

where $L_j(t)$ is the reported employment in industry j at time t, C is their total costs (including intermediate inputs) and $\hat{w}$ the unskilled wage presumed common to all industries.

What do we gain by this elaborate application of the human capital model above and beyond that of some far simpler alternative? We could just as well arbitrarily substitue $3,000, or some other poverty-subsistence line, for $\hat{w}$. The relative raw labor intensities by sector would not be affected. Nevertheless, it seemed esthetically more appealing to select some unskilled occupation as our yardstick for the average wage of the working poor. In what follows, we use the average annual wage earnings of hired farm labor as our $\hat{w}$ index. This unskilled wage is assumed to be uniform throughout the economy, but, of course, changing over time. In fact, we know otherwise. The presence of rural-urban cost of living differentials insures that the application of nominal farm wages to urban employment understates the true "raw" labor content of nonfarm activites and thus exaggerates farm relative labor intensities. Unions introduce further anomalies but the direction of bias is far less clear in this case. Factor market disequilibrium is a third labor market reality ignored in our analysis. Our hope is that none of these influences are sufficiently important to obfuscate our attempts to supply a cardinal ranking of sectors by raw labor intensity.

The Appendix supplies detail on methods and sources but a summary might be helpful. Table 1 lists by industry the direct and indirect

Table 1. Payments Impact on Unskilled Labor, Direct and Indirect, of $1 Purchase of Output from Industry j, 1963

Industry	$\tilde{\theta}_j$
1. Livestock	.2908
2. Crops	.2928
3. Forestry and Fishing	.2355
4. Agric. Services	.3022
5. Iron Mining	.1129
6. Nonferrous Mining	.1370
7. Coal Mining	.1934
8. Petroleum Mining	.1456
9. Stone and Clay Mining	.1689
10. Chemical Mining	.1549
11. New Construction	.2115
12. Maintenance Const.	.2193
13. Ord. and Accessories	.1742
14. Food	.2266
15. Tobacco	.1613
16. Textile Mills	.2353
17. Misc. Textiles	.1921
18. Apparel	.2858
19. Fabr. Textiles	.2576
20. Wood and Products	.2364
21. Wooden Containers	.2395
22. House Furniture	.2294
23. Office Furniture	.2238
24. Paper and Products	.1643
25. Paper Containers	.1782
26. Printing and Publishing	.1952
27. Basic Chemicals	.1442
28. Synthetics	.1458
29. Drugs and Soaps	.1605
30. Paints	.1535
31. Petrol Refining	.1262
32. Rubber Products	.1798
33. Leather Tanning	.2331
34. Shoes	.2592
35. Glass and Products	.1826
36. Stone and Clay	.1817
37. Iron and Steel	.1485
38. Nonferrous Metals	.1259
39. Metal Containers	.1739
40. Heating	.1769
41. Stampings Etc.	.1769
42. Hardware Etc.	.1760
43. Engines and Turbines	.1725
44. Farm Machinery	.1661
45. Constr. Equip.	.1717

Table 1 (cont.)

Industry	$\hat{\theta}_j$
46. Materials Hand. Equip	.1737
47. Metalworking Equip.	.1717
48. Special Ind. Equip.	.1674
49. General Ind. Equip.	.1719
50. Mach. Shop Prod.	.1732
51. Office Mach.	.1750
52. Service Ind. Mach.	.1769
53. Elect. Apparatus	.1840
54. Appliances	.1843
55. Light and Wiring Equip.	.1814
56. Communications Equip.	.1899
57. Electronic Components	.1873
58. Batteries Etc.	.1798
59. Motor Vehicles and Equip.	.1417
60. Aircraft and Parts	.1743
61. Trains and Ships	.1725
62. Instruments Etc.	.1718
63. Photo. Apparatus	.1617
64. Misc. Manufactures	.2036
65. Transportation	.1810
66. Communications	.1407
67. Radio and TV Broadcasting	.1715
68. Utilities	.1405
69. Trade	.2429
70. Finance and Ins.	.1114
71. Real Estate	.1104
72. Hotels and Pers. Serv.	.3289
73. Business Services	.2012
74. Auto Repair	.2591
75. Amusements	.2613
76. Medical and Education	.2580
77. Fed. Gov.	.2339
78. State and Loc. Gov.	.2423

Source: See Appendix and text for discussion of methods and sources.

unskilled labor intensity of 79 of the sectoral activities listed by the Department of Commerce in their 1963 input-output matrix. The items in Table 1 can be read as labor intensities or as the payments impact on the working poor from a $1 final demand expenditure on outputs of industry j. Call this payments impact $\tilde{\theta}_j$:

$$[3] \quad \tilde{\theta}_j = \ell\hat{w}Qy_j \quad ,$$

where y_j is the final demand for j, Q is the Leontief inverse for 1963 and each q_{ij} element measures dollar amounts of ith goods required directly and indirectly to deliver the dollar's worth of y_j, ℓ is a vector of 1963 labor coefficients each element of which denotes the number of persons engaged per dollar of the jth output, and $\hat{w}$ is a vector of 1963 unskilled wages (annual earnings), by assumption constant across all j.

The reader will note the wide variance in $\tilde{\theta}$ across sectors. Among the commodity-producing sectors, for example, the figures range from 0.11 for iron mining to 0.29 for livestock and crops, the latter two and one half times the former. The spread is even greater among service sectors, from finance and real estate, 0.11, to hotels and personnel services, 0.33. Now then, what happens to this variance when these sectors are aggregated to more meaningful final demand categories?

4. Who Pays for the Services of America's Working Poor?

All that remains is to derive some appropriate final demand weighting scheme to answer the questions raised in Section 2. To do so, expression [3] need only be expanded to read

$$[4] \quad \tilde{\theta}^f = \hat{\ell w} Q y^f \quad ,$$

where y^f is now a final demand vector, the elements of which are $\phi^f_j y_j$ such that $\Sigma_j \phi^f_j y_j = \$1$, and thus the "budget weights" sum to one, $\Sigma_j \phi^f_j = 1$. We denote each "final demand experiment" by the superscript f, and the adding up constraint is introduced so that we can focus solely on demand mix. The results appear in Tables 2 and 3.

4.1 Pre Fisc and Post Fisc

Table 2 underscores the fact that there is far greater variety in unskilled labor intensities within the conventional final demand expenditure categories than between them. For the purpose of exploring the impact of shifting final demand mix on the relative economic position of the working poor, C, I and G simply fail to do the job. Nonetheless, in 1963 public final demand purchases were considerably more intensive in unskilled labor than were private expenditures: in Table 2 the respective values for $\tilde{\theta}^f$ are 0.2359 and 0.1996. The greater unskilled labor intensity of public expenditures is not explained by a different pattern of public purchases from private business, since the government purchases' impact is 0.1945, almost identical to the private expenditure impact. The explanation lies instead with "general government" activities, among the most unskilled labor intensive activities in America. Obviously, the surge in federal, state, and local government expenditures from 5.0 to 12.1 percent of national income between 1929 and 1963 must have raised the relative demand for the services of the working poor profoundly. Similarly, Table 2 suggests that the postwar public expenditure shift favoring state and local govern-

Table 2. Payments Impact on Unskilled Labor, Direct and Indirect, of $1 Expenditures of Final Demand, 1963

Final Demand Category (f)	Weighting Scheme	θ^f
1. Investment Expenditures:		
1.1 Total Investment	SCB(1963), p. 35	.1980
1.2 Investment, including Med. and Education	ibid.	.2170
1.2.1 Producer's Durables	ibid.	.1786
1.2.2 Construction	ibid.	.2115
1.2.3 Medical and Education	ibid.	.2580
2. Consumption Expenditures:		
2.1 Total Consumption	BLS(1961), urban mean family post-tax income	.1965
2.1.1 Housing	ibid.	.1104
2.1.2 Fuel and Light	ibid.	.1405
2.1.3 Autos and Appliances	ibid.	.1497
2.1.4 Other Commodities	ibid.	.1704
2.1.5 Food	ibid.	.2230
2.1.6 Other Services	ibid.	.2281
2.1.7 Medical and Educ. Services	ibid.	.2580
2.1.8 Apparel	ibid.	.2858
2.2 Total Consumption (Excl. Services)	BLS(1961), urban mean family post-tax income	.2001
3. Government Expenditures:		
3.1 Total Federal	SCB(1963), p. 35	.2272
3.1.1 General Government	na	.2864
3.1.2 Government Purchases	SCB(1963), p. 35	.1879
3.2 Total State and Local	ibid.	.2451
3.2.1 General Government	na	.2817
3.2.2 Government Purchases	SCB(1963), p. 35	.2034
3.3 Total Government	ibid.	.2359

Source: The underlying θ_j are for 1963 and are taken from Table 1. The final demand weights used to aggregate up to these expenditure categories are from OBE, Department of Commerce, Input-Output Structure of the U.S. Economy: 1963, reprinted in Survey of Current Business (November 1969), and abbreviated SCB(1963) above, Table 1, p. 35; and Bureau of Labor Statistics, Survey of Consumer Expenditures, 1960-1961, Supplement No. 3 (July 1964, March 1965 and April 1965).

Table 3. Payments Impact on Unskilled Labor, Direct and Indirect, of $1 Consumption Expenditure by Region and Income Class, 1961-1963

Income Class	Urban		Rural	
	Excluding Services	Including Services	Nonfarm	Farm
Below $1,000	.2029	.1943	.2078	.2121
$1,000-$1,999	.2046	.1940	.2037	.2179
$2,000-$2,999	.2039	.1980	.2003	.2166
$3,000-$3,999	.2009	.1982	.1975	.2140
$4,000-$4,999	.2000	.1972	.1962	.2107
$5,000-$5,999	.2001	.1965	.1959	.2106
$6,000-$7,499	.2008	.1991	.1982	.2091
$7,500-$9,999	.2016	.2015	.1999	.2100
$10,000-$14,999	.2028	.2080	.2043	.2102
Above $15,000	.2064	.2218	.2106	.2134
At Mean Income After Taxes	.2001	.1965	.1962	.2107

Source: The underlying $\tilde{\theta}_j$ are for 1963 and are taken from Table 1. The consumer expenditure weights are taken from the Survey of Consumer Expenditures, 1960-1961.

ment (at the expense of federal expenditures) also must have fostered a relatively strong demand for the services of the working poor.

A full evaluation of the post fisc impact on income distribution would, of course, require some judgement regarding which private expenditures contract most extensively in response to some specific tax policy. If aggregate consumption, rather than investment, absorbs the majority of the private expenditure contraction, then the favorable impact on the working poor is somewhat magnified, but not by much. As we shall see below, aggregate investment and consumption have almost identical payments' impacts on the working poor so that it's the public-private expenditure comparison that counts, rather than the aggregate investment-consumption mix. The composition of investment itself is another matter entirely, and that discussion is reserved for Section 4.3. Similarly, issues of progressivity and tax incidence are best analyzed in Section 4.2 where the unskilled-labor intensities of consumption bundles are examined by income class.

These qualifications aside, on the basis of the discussion thus far we can certainly conclude that public expenditures have a pro-poor bias at the production level as well as the consumption level.

4.2 Engel Effects, Redistribution and Growth

Table 3 presents the consumption expenditures evidence by income class. It is not true that the poor consume unskilled-labor intensive products more heavily than the rich. On the contrary, for urban areas the rich consume an expenditure bundle more unskilled-labor intensive than the poor. That is, a dollar's consumption by the urban rich has a more potent payments impact on the working poor than the same dollar

spent by the urban poor. This relationship is weaker for rural nonfarm areas, and it disappears entirely for farm families. Nonetheless, for urban households we find the ingredients for a potential paradox: efforts to redistribute income by transfer payments will be partially thwarted since the induced change in the economy-wide consumption mix diminishes the relative demand for the services of the working poor. While the mechanism is unlikely to be very strong, we must conclude that Engel effects have a modest pro-poor bias. In the language of Section 2.2, the "modern stagnationist" thesis can be rejected, at least for the American economy of the 1960s.

Note that the positive correlation between income levels and unskilled-labor intensities of consumption bundles can be attributed solely to the impact of services. As Table 3 shows, when service expenditures are excluded the correlation disappears entirely. Panel 2 in Table 2 presents some disaggregated data which should be helpful in clarifying these relationships. "Necessities" are a mixed bag. While housing, fuel and light expenditures all have a very strong anti-poor bias at the production level, food, medical and education expenditures have a powerful pro-poor bias. Similar anamolies appear for "luxuries": consumer durables have an anti-poor bias while apparel expenditures are very pro-poor on the production side.

4.3 Capital Accumulation and Technological Progress

The Uzawa-Gordon premise seems to be unfounded, based upon the evidence displayed in Table 2. The "capital goods" sector is more capital intensive than the "consumption goods" sector, not less, although

although the difference between 0.1980 and 0.1965 hardly seems noteworthy. The more interesting result, however, lurks just beneath these arbitrary aggregates: producers' and consumers' durables are far less unskilled-labor intensive than other investment or consumption expenditures. Consider the consumption of commodities in 1963. The facts appear to be that expenditures on automobiles, appliances, and other durable commodities have almost half the payments impact on the working poor compared with expenditures on apparel and food. Obviously, any force which favors an economy-wide household shift into consumer durables is strongly anti-poor biased. Similarly, any force which favors an investment mix shift in favor of producer durables is strongly anti-poor biased. Given what we assume to be very high price elastic demands for durables, then relatively rapid total factor productivity gains in such sectors will inevitably induce inegalitarian trends. Periods of unusual unbalancedness in total factor productivity growth favoring durables will indeed tend to produce inequality since the working poor will find relative demands for their services declining. It no longer appears coincidence that the episodic income levelling from 1929 to 1948 was also a period of sluggish rates of output shift towards durables, or that total factor productivity growth rates were relatively balanced by sector too (Williamson, 1975). The correlation persists for the pre-1929 period as well, although it is unbalancedness, rapid durables accumulation and inequality pressures which are prevalent in the early 20th century.

What about the striking shift in investment modes from physical accumulation to human capital accumulation? Table 2 shows quite

clearly that rapid growth in medical services and education since the 1920s, and especially the postwar acceleration in those trends, should have had a very strong pro-poor bias. The payments impact on the working poor from expenditures on education and medical care are among the highest listed in Table 2. To the extent that outputs of these human capital producing sectors are more equally shared than other investment goods production, then their expansion must have had a doubly potent pro-poor bias.

5. Parameter Stability and Historical Laws?

Do these relationships uncovered for the 1960s appear earlier in the century? Are they instead peculiar to contemporary America?

Table 4 supplies some answers. First, we note an extraordinary stability in "factor intensity rankings" between World War I and the Viet Nam decade. Only two expenditure categories change their relative intensity, apparel and construction. The latter is especially noteworthy. While construction generated a very high payments impact on the working poor in 1963, exceeding that of aggregate consumption, that was not the case in 1919. Over the past five decades, construction has become increasingly unskilled-labor intensive. Since construction was also a larger share in total investment a half century ago, aggregate investment was even less unskilled-labor intensive then compared to now. Thus, the Uzawa-Gordon premise has even less to support it based on early 20th century evidence: consumption expenditures were far more labor-intensive. It might also be noted in passing that this finding suggests confirmation of an inherent instability in the economy of the 1920s: to the extent that greater inequality

Table 4. Payments Impact on Unskilled Labor, Direct and Indirect, of $1 Expenditure on Final Demand: $\tilde{\theta}_f$ for 1919, 1939, and 1963

Final Demand Category (f)	1919	1939	1963
1. Aggregates			
1.1 Consumption I	.2084 (100)	.1764 (100)	.2001 (100)
1.2 Consumption II	na	.1411 (80)	.1965 (98)
1.3 Investment	.1488 (71)	.1695 (96)	.1980 (99)
1.4 Government	na	na	.2392 (120)
2. Detail			
2.1 Housing	0	0	.1104 (55)
2.2 Fuel and Light	.1479 (71)	.0997 (57)	.1405 (70)
2.3 Consumer Durables	.1418 (68)	.1288 (73)	.1497 (75)
2.4 Misc. Consumer Goods	.1641 (79)	.1186 (67)	.1704 (85)
2.5 Producer Durables	.1318 (63)	.1112 (63)	.1786 (89)
2.6 Government Purchases	na	na	.1943 (97)
2.7 Construction	.1653 (79)	.2090 (118)	.2115 (106)
2.8 Food	.2443 (117)	.2154 (122)	.2230 (111)
2.9 Misc. Consumer Services	.1993 (96)	.1408 (80)	.2281 (114)
2.10 Med. and Educ. Services	na	na	.2580 (129)
2.11 General Government	na	na	.2840 (142)
2.12 Apparel	.1660 (80)	.1776 (101)	.2858 (143)

Sources: 1963 The data is taken directly from Table 2.

1939 Housing is set equal to zero by assumption. Consumption I refers to commodity purchases, housing, transportation and communications only, but wholesale and retail markups are accounted for throughout. The underlying $\tilde{\theta}_j$ are taken from Appendix Table A-1. All consumption expenditure items are weighted at 1935-1936 urban mean family incomes. (See Table 5.) Produced durables is an unweighted average of capital goods sectors. Total investment is weighted by 1939 investment composition in Kuznets, 1961, Table R-4, p. 490.

1919 Housing is set equal to zero by assumption. Consumption I refers to commodity purchases, housing, transportation, and communications only, but wholesale and retail markups are accounted for throughout. Miscellaneous consumer services refers to transportation and communications. The underlying $\tilde{\theta}_j$ are taken from Appendix Table A-2. All consumption expenditure items are weighted at 1918-1919 urban workers' mean family income. Producer durables is an unweighted average of capital goods sectors. Total investment is weighted by 1919 investment composition in Kuznets, 1961, Table R-4, p. 490.

Figures in parentheses are ratios (x 100) to Consumption I.

Retail and wholesale markups are necessary for 1919 to make IO and consumer expenditure data consistent. The markups are taken from H. Barger, Distribution's Place in the American Economy Since 1869 (New York: NBER, 1955), Table 26, p. 92.

fostered higher savings and investment, the shifting mix of aggregate demand would have tended to foster greater inequality, followed by further shifts in demand mix. This inherent instability has apparently disappeared from the American scene, at least based on our 1939 and 1963 observations.

Second, producer and consumer durables were even less unskilled-labor intensive in the early 20th century than in the 1960s. It appears thus far that all of the conclusions reached in Section 4 are even more strikingly confirmed on the pre-World War II data.

The conformity stops with Tables 5A and 5B. Based on the 1963 data we were able to conclude that Engel effects had a modest pro-poor bias. This was not the case prior to World War II. The relationship fails to appear for urban families in the 1930s. Indeed, there is evidence of a weak anti-poor bias since higher income brackets exhibited slightly lower $\hat{\theta}^f$ than middle and low income classes. The anti-poor bias of Engel effects is strongly confirmed for nonfarm and farm families. The evidence for 1919 in Table 5B suggests an anti-poor bias even among urban workers.

In short, there <u>is</u> confirmation of the "modern stagnationist" thesis based on this data drawn from the 1930s and 1920s. This finding is reinforced by the added knowledge that nonhuman investment-a high income activity-was far more capital and skill intensive then than now. All the ingredients of inherent instability are there, a comforting result given the extensive qualitative literature in which historians have cited "inherent structural instability" during the 1920s and 1930s.

Table 5A. Payments Impact on Unskilled Labor, Direct and Indirect, of $1 Consumption Expenditure by Region and Income Class, 1935-1936

Income Class	Urban		Rural	
	Excluding Services	Including Services	Nonfarm	Farm
Below $500	.1852	.1390	.1535	.2106
$500-$749	.1836	.1422	.1550	.2114
$750-$999	.1831	.1422	.1535	.2066
$1000-$1249	.1796	.1428	.1523	.1980
$1250-$1499	.1795	.1420	.1506	.1951
$1500-$1749	.1776	.1419	.1496	.1853
$1750-$1999	.1764	.1411	.1480	.1887
$2000-$2499	.1753	.1417	.1480	.1817
$2500-$2999	.1743	.1406	.1484	.1821
$3000-$3999	.1737	.1409	.1489	.1757
$4000-$4999	.1724	.1400	.1441	.1641
$5000-$10,000	.1709	.1376	.1484	.1624
At Mean Income After Taxes	.1764	.1411	.1506	.1980

Source: The underlying $\hat{\theta}_j$ are for 1939 and are taken from Appendix Table A-1. The consumer expenditure weights are taken from National Resources Planning Board, Family Expenditures in the United States, Supplement to Consumer Income and Expenditures (Washington, D.C.: 1941).

Table 5B. Payments Impact on Unskilled Labor, Direct and Indirect, of $1 Consumption Expenditure by Urban Workers, 1919

Income Class	Urban Workers
Below $900	.2123
$900-$1199	.2118
$1200-$1499	.2096
$1500-$1799	.2084
$1800-$2099	.2073
$2100-$2499	.2062
Above $2500	.2062
At Mean Income Before Taxes	.2084

Source: The underlying $\tilde{\theta}_j$ are for 1919 and are taken from Appendix Table A-2. The consumer expenditure weights are taken from BLS, Cost of Living in the U.S., Bulletin No. 357 (Washington, D.C.: 1924), which is based on a 1918-1919 survey of white urban industrial workingmen's families.

To summarize, all of these findings would appear to strengthen our arguments regarding the role of demand mix in accounting for the three phases of trending inequality since the turn of the century. Identical shifts in demand mix should have had an even more potent impact on the relative demand for the services of the working poor prior to World War II than currently. The pre 1929 inequality surge and the post 1929 revolutionary levelling took place during a period when relative factor intensities were at their widest. The postwar stability coincides with an era of narrower factor intensity ranges. It seems to us that these findings are sufficiently interesting to warrant more detailed research, sampling many more points in time, and adopting alternative measures of the working poor.

FOOTNOTES

[1]It should be emphasized that nowhere does this paper concern itself with cycles. The most recent contribution to this active literature on distribution over the cycle seems to be Crotty and Rapping (1975).

[2]True, when capital goods requirements are added to generate the necessary long-run capacity responses, the ranking can be reversed as in the cases of Brazil (Morley and Smith, 1973) and Columbia (Jimenez, 1972), but it seems more appropriate to treat the capital accumulation issue separately.

[3]The data are taken from the Economic Report of the President (1974), Table C-2, p. 250.

6. APPENDIX

The input-output data relates to three points in time: 1919, 1939, and 1963. Before any operations were carried out, we found it necessary to reclassify the sectoral cost share data and the consumer expenditure categories to align them with the input-output sectoral breakdown. Especially for the earlier years, this procedure was extensive and often quite arbitrary. The details will be made available upon request. In addition, the1919 calculations required the applicatinn of retail and wholesale markups to reconcile the expenditure and input-output data. The markups were taken from Harold Barger, Distribution's Place in the American Economy Since 1869 (Princeton: NBER, 1955), Table 26, p. 92. Finally, while it is the unskilled wages share in total costs which is relevant to the text calculations, we found it useful to take an intermediate step and compute the unskilled wages share in value added. The sources listed below relate to this intermediate cost share calculation.

1919 Calculation

The employment and value added ("national income originating") data is taken from Simon Kuznets, National Income and Its Composition, 1919-1938, Vol. 1 (New York: NBER, 1941), Tables 59 and 63, pp. 326 and 334. The 1919 unskilled wage is the average annual earnings of hired farm labor. It is taken from Stanley Lebergott, Manpower in Economic Growth (New York: McGraw-Hill, 1964), Table A.18, p. 525. The consumer expenditure data is based on a 1918-1919 white family urban industrial worker sample: U.S. Department of Labor, BLS, Cost of Living in the United States, Bulletin No. 357 (Washington, D.C.: USGPO, 1924). The input-output data is the 1919 matrix

reported in Wassily Leonteif, The Structure of the American Economy, 1919-1939 (New York: Oxford University Press, 1951), Table 5.

1939 Calculation

The employment and value added data is taken from U.S. Department of Commerce, OBE, National Income and Product Accounts of the U.S., 1929-1965 (Washington, D.C.: USGPO, 1966), Supplement to the "Survey of Current Business," Tables 1.12 and 6.6, pp. 18-21 and 110-113. The 1939 unskilled wage is the average annual earnings of hired farm labor, Table 6.5, pp. 106-109. The consumer expenditure data is taken from the National Resources Planning Board, Family Expenditure in the U.S. (Washington, D.C.: USGPO, 1941), Supplement to Consumer Income and Expenditures, and relates to the years 1935-1936. The input-output data is the 1939 matrix reported in Leontief, The Structure of the American Economy, Table 24.

1963 Calculation

The 1963 employment, value added and unskilled wage data are taken from the same sources as listed above for 1939. The input-output data is the 1963 matrix reported in U.S. Department of Commerce, OBE, Input-Output Structure of the U.S. Economy, 1963 reprinted in the Survey of Current Business (November 1969). The consumer expenditure data relates to 1960-1961. It appears under the title Survey of Consumer Expenditures and Income, 1960-1961 in the following reports: BLS Report No. 237-88, Supplement 3 (March 1965); BLS Report No. 237-38, Supplement 3, Part A (July 1964); and USDA Report No. 5 (April 1965).

Two appendix tables for 1919 and 1939 follow.

Table A-1. Payments Impact on Unskilled Labor, Direct and Indirect, of $1 Purchase of Output from Industry j, 1939

	Industry	$\hat{\theta}_j$
1.	Agric. and Fishing	.2857
2.	Food Processing	.1559
3.	Ferrous Metals	.0969
4.	Iron and Steel Foundry	.1157
5.	Shipbuilding	.1359
6.	Agric. Machinery	.1054
7.	Engines and Turbines	.0975
8.	Motor Vehicles	.1302
9.	Aircraft	.1219
10.	Transp. Equipment	.0947
11.	Ind. and Heating Equip.	.0954
12.	Machine Tools	.1009
13.	Merch. and Serv. Machines	.1168
14.	Elect. Equipment	.1125
15.	Iron and Steel Products	.1080
16.	Nonferrous Metals	.0849
17.	Nonmetallic Minerals	.1134
18.	Petrol. Refining	.1037
19.	Coal and Coke	.1357
20.	Gas and Elect. Power	.0837
21.	Communications	.1221
22.	Chemicals	.1031
23.	Lumber	.1660
24.	Furniture	.1538
25.	Pulp and Paper	.1129
26.	Printing and Pub.	.1213
27.	Textile Prod.	.1575
28.	Apparel	.1820
29.	Leather	.1574
30.	Rubber	.1028
31.	Other Manuf.	.1261
32.	Construction	.2090
33.	Misc. Transp.	.1464
34.	Transocean. Transp.	.0417
35.	Steam RR	.1342
36.	Trade	.1574
37.	Bus. and Pers. Serv.	.1325
38.	Eating Places	.1915

Source: W.W. Leontief, The Structure of the American Economy (New York: Oxford, 1951), Table 24 and U.S. Department of Commerce, Office of Business Economics, National Income and Product Accounts of the U.S., 1929-1965 (Washington, D.C., 1966). See appendix and text discussion.

Table A-2. Payments Impact on Unskilled Labor, Direct and Indirect, of $1 Purchase of Output from Industry j, 1919

Industry	$\hat{\theta}_j$
1. Agriculture	.3444
2. Flour Etc.	.2772
3. Canning Etc.	.2046
4. Bakery Products	.1745
5. Sugar Etc.	.1046
6. Beverages	.1310
7. Tobacco	.1418
8. Meat Packing	.2804
9. Butter and Cheese	.2794
10. Other Food Mfg.	.1066
11. Iron Mining	.1355
12. Blast Furnaces	.1527
13. Steel and Rolling Mills	.1799
14. Other Iron and Steel	.1432
15. Automobiles	.1453
16. Nonferrous Metals	.1803
17. Smelting and Refining	.1386
18. Brass Etc. Mfg.	.1068
19. Nonmetal Minerals	.1631
20. Petrol. and Nat. Gas	.1217
21. Refined Petrol.	.1252
22. Coal	.2434
23. Coke	.2183
24. Manufactured Gas	.1575
25. Electric Utilities	.1246
26. Chemicals	.1116
27. Lumber Products	.1939
28. Other Wood Products	.2183
29. Pulp and Paper	.1180
30. Other Paper Products	.1512
31. Printing and Publishing	.1617
32. Yarn and Cloth	.1954
33. Clothing	.1664
34. Other Textiles	.1634
35. Leather Tanning	.1441
36. Leather Shoes	.1670
37. Other Leather Prod.	.1566
38. Rubber Products	.1261
39. Industries, n.e.c.	.1386
40. Construction	.1653
41. Transportation	.1993

Source: W.W. Leontief, The Structure of the American Economy (New York: Oxford, 1951), Table 5; S. Kuznets, National Income and Its Composition, 1919-1938, Vol. 1 (New York: NBER, 1941); and S. Lebergott, Manpower in Economic Growth (New York: McGraw-Hill, 1964). See appendix and text discussion.

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