

LANCE TAYLOR

Modeling Distribution and Growth: Replies to Garbellina and Wirkierman, Harcourt, and Nell

***Abstract:** Income sources and uses are examined for the top 1% and lower 99% of the US size distribution – the groups are proxies for “capitalists” and “workers.” Large flows – notably proprietors’ incomes at the top and fiscal transfers at the bottom – cannot easily be assigned to capital or labor. Financial payments (interest and dividends) are concentrated at the top. Capital gains are similarly concentrated and comparable in magnitude. Together with financial flows they exceed business profits net of depreciation. Cumulating these flows over time is consistent with the empirical observation that the valuation ratio for the US corporate sector is greater than one. The richer group has positive savings; they are negative for the bottom 99% overall (especially below the 80th percentile of the size distribution). These observations suggest that the US economy is not at a steady state. The nature of shifts in income and wealth distributions needed to support changes in steady states is discussed in light of the comments in this symposium.*

Arnhold Professor of International Cooperation and Development emeritus, Schwartz Center for Economic Policy Analysis (SCEPA), New School for Social Research. Help from Ozlem Omer and Rishabh Kumar is gratefully acknowledged. Work supported by the Institute for New Economic Thinking.

Sources and Uses of Income for the Rich and the Rest

Concentration of income and wealth remains at the forefront of public interest; whether macroeconomists building models have much to say about it is another issue. In this reply to Garbellina and Wickierman (hereafter GB), Harcourt, and Nell, I would first like to draw attention to how the data do not fit standard models like those advanced by Thomas Piketty, Luigi Pasinetti, and myself, and then go on to specific comments about how changing income and wealth distributions fit into macroeconomic adjustment.

The models typically work with two classes – “capitalists” or “rentiers” vs. “workers.” Such clearcut social distinctions are impossible to extract from available data. In tune with recent political events, however, one *can* say something about the relative economic positions of relatively rich and poor people – say the top 1% and bottom 99% of the size distributions of income and wealth. They don’t have “pure” income flows, but there are sharp distinctions between the classes

For the USA, Figures 1 and 2 show sources of incomes per household, adjusted for consistency with the national income and product accounts (Taylor, et. al., 2014).¹ The scales in the diagrams differ. The top 1% saw their mean real income (not including capital gains) rise from a bit over \$500,000 to more than \$2.5 million over two decades. The numbers for the 99% were \$60,000 and \$110,000 (with most of the increase concentrated in the decile just below the top).

Figure 1

Figure 2

The diagrams show how the groups have diverse sources of income. Payments to labor still account for around one fifth of the total of the top 1%. They also receive relatively modest transfers from the government and other sources. Financial flows (interest and dividends) provide more than wages. “Other” incomes including rents, capital consumption allowances or depreciation (CCA), and especially proprietors’ incomes from unincorporated enterprise are as large as finance. Labor compensation provides the bulk of income for the bottom 99%. Transfers are the next-biggest contributor, with minor additions from finance and other sources. As is widely recognized, how to assign shares of several of these income flows to “capital” and “labor” is unclear.

The income totals for the two groups approximate national income as specified in the UN System of National Accounts (SNA). The top group also receives considerable (realized) capital gains. They fluctuate over time, but at least in favorable years have the same magnitude as labor income. Gains for the bottom 99% scarcely figure.

Two additional points are worth making. The first is that labor compensation and transfers are sources of income concentrated at the bottom of the income distribution. Savings therefrom can reduce the concentration of wealth, as James Meade (1964) pointed out 50 years ago. The impact will be weaker insofar as the capitalists’ saving rate s_c exceeds the workers’ s_w , and capitalists receive a higher rate of profit.²

Second, Meade is irrelevant insofar as according to US data savings of the bottom 99% are *negative*. In 2008, the mean saving rate on after-tax income (not including capital gains) of the top 1% was 81%. The rate for households in the 91st to 99th percentiles was 33%, and 21% for the 81st to 90th percentiles. Households below

that level had negative rates. Total saving for the top percentile was \$1.453 trillion as compared to -\$0.587 trillion for the rest of households.

Flows of Incomes and Saving

The commentators observe that Piketty has a hard time dealing with the distinction between “wealth” and “capital.” Contemporary income and financial accounting provide the means (at least partially) to understand the difference at the macro level. We begin with the income and product accounts and proceed to flows of funds and balance sheets. Capital gains play a big role as will become clear.

Figure 3 lays out a social accounting matrix for a simplified economy without government, foreign trade, and (for the moment) depreciation. It is based on the assumption that it is somehow possible to assign all the income flows in Figures 1 and 2 to primary factors.

Figure 3

The key accounting convention is that sums of corresponding row and columns should be equal. There are four sectors – households divided into the two social classes, business, and “finance” which receives interest and dividend payments from business and distributes them (without incurring costs) to households.³

The first row gives the decomposition of output X into consumption and gross investment; the first column is a breakdown of costs. Worker households receive labor payments $\psi_w X$ from business and transfers T_w from finance to give income Y_w . In the corresponding column they consume C_w and save S_w in the row for “macro balance.” The accounting for capitalists is similar.

After paying labor, business has gross profits πX . A portion T_b is transferred to finance for distribution to households; the rest is saved as S_b . The macro balance row shows that total saving equals investment.

The main reason to display the SAM is that substitution among the entries shows that

$$\pi X = T_b + S_b , \quad (1)$$

i.e. profits are exhausted by financial transfers and business saving.⁴

Business Saving and Capital Gains

Can households access the wealth generated by gross business saving, which fluctuates in the range of \$1.5 trillion per year? If not, treating total profits $\pi X = rK$ as household income doesn't make a lot of sense. Capital gains on equity and the stock of residential housing presumably function as the transmission mechanism. We can quickly demonstrate the accounting in connection with the balance sheets in Figure 4.

Figure 4

The term E stands for equity outstanding (treated as a liability of business) at price P_e . Household wealth is Ω_h , saving is S_h and debt is D_h . Let a "dot" over a variable represents its change over time and a "hat" its growth rate. Households' flows of funds take the form

$$S_h + \dot{D}_h = P_e \dot{E} ,$$

i.e. saving plus new debt finance purchases of new equity at the going price.

Next, "differentiate the balance sheet" in Figure 4 and substitute the flow of funds. The change in household wealth becomes

$$\dot{\Omega}_h = S_h + \hat{P}_e P_e E \quad .$$

Wealth increases with saving and capital gains.

If I is gross investment, business flows of funds are

$$S_b + \dot{D}_B + P_e \dot{E} = I \quad .$$

Saving and issuing new debt and equity are sources of funds; capital formation is the use.

Taking into account depreciation δK , the change in business net worth becomes

$$\dot{\Omega}_b = S_b - \delta K - \hat{P}_e P_e E$$

The question at hand is how net business saving $S_b - \delta K$ compares to capital losses $-\hat{P}_e P_e E$ due to rising prices of equity. Figure 5 presents data on all capital gains (including residential housing) since the mid-1980s. On the whole, yearly gains by households are greater than business saving net of depreciation so $\dot{\Omega}_b < 0$. Sums exceeding profits are transferred to households via financial flows and asset price changes, running down firms' net worth.

Figure 5

Distribution of Wealth

Figure 6 presents a snapshot of the US distribution of wealth in 2012, based on the Federal Reserve's Financial Accounts and Edward Wolff's (2012) breakdown of the size distribution of holdings which comprise physical capital, the value of equity, and other financial instruments ("bonds"). Assets held by each group of actors have a negative sign; liabilities and net worth are positive. The numbers are not consistent --

reported holdings of bonds by households and finance exceed the supply from firms, government, and the rest of the world.

Figure 6

In any case, consistent with the data on flows in Figure 5, the business sector has negative net worth. The value of equity outstanding (\$29,483 trillion) substantially exceeds firms' capital stock (\$19,903 trillion). In common American or Cambridge UK usage the "valuation ratio" of equity value to capital (q or v respectively) is greater than one.

Total wealth of the private sector – households (and nonprofit institutions) and business -- is the sum of the value of fixed assets or "capital" K , government debt, and net foreign assets. Capital is the dominant entry. Households are split into the top 1% and the bottom 99% of holders of wealth (the 20%-80% split is also included for reference). The top 1% directly own 35.4% of household net worth, consistent with other estimates. They hold only 26.9% of household capital stock, basically residential housing (the top 20% hold 80.7%!). Households overall hold roughly one-third of capital, and business holds around one-half. The rest, infrastructure basically, is owned by the government.

Income and Wealth Distributions in Steady States

The data just reviewed strongly suggest that the US economy is *not* in a steady state – concentration of income (though not wealth according to Wolff, 2012) has increased markedly over recent decades; households in the bottom percentiles of the income distribution have negative saving rates; and the business sector has negative

net worth because rising prices of equity have outpaced its net saving. Fairly large income flows, moreover, are difficult to assign to participation of labor and capital in the process of production.

Despite these empirical problems, analysis of steady growth following Pasinetti's lead makes sense. It adds invaluable perspective. In response to the commentators, let me focus on what they say about my paper's discussion of distribution and growth. Their observations about Piketty are interesting but not my responsibility.

I agree with Garbellina and Wickierman that I am interested in dynamics around the steady state while Pasinetti is not. They do, however, make a couple of slips. One is associated with their differential equation for the growth rate of the capital concentration ratio $Z = K_c/K$,

$$\dot{Z} = Z[(s_c - \alpha)r - g_0] \quad . \quad (2)$$

This equation is based on the aggregate investment function (5) in my paper as opposed to the saving function (4) which I used to derive my growth equation (9).

Because investment equals saving along any growth path, both the GW and my equations will generate the same results. GW assert, however, that at a Pasinetti steady state "... $r = g_0/(s_c - \alpha)$, *independently of Z.*" This statement is not true. I point out pretty clearly in connection with my paper's Figure 2 that r *does* depend on Z or vice-versa via the profit-led aggregate demand function (6) and profit-squeeze distributive function (7). If the parameters on the right-hand side of the GW growth equation (2) change then so must r and Z in a new steady state.

Shifts in the distributions of both income and wealth are key macro adjustment mechanisms around steady states. To see why we can follow GW and Nell in drawing

upon Pasinetti's (1974) comments on his basic model. The key point is that "flow-stock" ratios must equalize across comparable variables in steady growth to make sure that all variables grow at the same rate. Specifically, if S_w and S_c are savings *flows* of workers and capitalists and S is total saving then it must be true that

$$S_w/K_w = S_c/K_c = S/K = g \quad .$$

We can parameterize these relationships using lower case s_w and s_c for saving *rates*, letting W be the wage bill, and noting that $K_w = K - K_c$. Then these equations can be restated as

$$s_w[r(K - K_c) + W]/(K - K_c) = s_c r K_c / K_c = g \quad . \quad (3)$$

Pasinetti's formula

$$g = s_c r$$

follows immediately. The profit rate adjusts to changes in the capitalists' saving rate and the growth rate.

More interesting is that fact that the capital concentration ratio adjusts as well.

One can use (3) to derive

$$s_w r + s_w W / (K - K_c) = s_c r \quad .$$

Since $K - K_c = K(1 - Z)$ we get

$$1 - Z = [s_w / (s_c - s_w)] (W / rK) \quad . \quad (4)$$

Pasinetti and GW are not clear about what happens to the income ratio W/rK if the growth rate increases, but presumably it declines à la the widow's cruse. But then Z must increase, with the steady state wealth distribution shifting toward capitalists.

Following Meade Z will decrease with an increase in s_w . Macroeconomic flows and stocks both have roles to play in movements between steady states.

Just a few quick comments on Harcourt. He is perfectly correct in contrasting a data-based empirical critique of the aggregate production function, initiated by my New School colleague Anwar Shaikh, and Joan Robinson's theoretical demolition. I should have been more explicit on those points.

Figures 3-6 suggest that it is possible to disentangle, at least in part, the links between household holdings of financial liabilities issued by firms and their receipts of profit flows. Indeed, they can receive more than the profits that exist. A valuation ratio with a value well over unity points to an \$11 trillion black hole in the US financial system – 20% of total net worth. In a way q (or v) $\gg 1$ updates the Balogh-Kaldor observation about monetarism being “the incomes policy of Karl Marx.” Contemporary debate in the USA focuses on the unequalizing and destabilizing effects of spiraling asset prices set off by the Federal Reserve's *low* interest rates.

Nell is of course correct in emphasizing the distinction between financial and real capital. Using balance sheets and flows of funds is a step in the right direction, but they still leave out shadow banking and other complications of the financial crisis.

With regard to an investment function, the basic results in my paper rely on a positive response of capital formation to the profit rate, which is pretty well established. The relationship jumps around but for analyzing growth, it seems fair to abstract from its capriciousness.

Nell's equation (2), restated as (3) above, makes sense but with $s_w < 0$ it suggests that workers would end up with negative K_w in a steady state. One could salvage the model by introducing balance sheets and letting the lower classes have

negative net worth, but that still elides macro complications of running up arrears, bankruptcy, and informal default.

Notes

1. Only new references are presented here. See my paper in the symposium for the others.

2. A relatively high level of s_w explains the existence of the Samuelson-Modigliani steady state in the Pasinetti model. Piketty cites Meade in a couple of footnotes in support of his obsession with $r > g$.

3. This treatment of finance approximates the set-up of the US accounts.

4. In SAMs based on US data, the equality in (1) holds to about three significant digits, with discrepancies arising due to minor transfers not flowing through the fiscal and financial systems.

References

Meade, James E. 1964. *Efficiency, Equality, and the Ownership of Property*, London:

George Allen & Unwin

Pasinetti, Luigi L. 1974. "The rate of profit in an expanding economy," in *Growth and*

Income Distribution: Essays in Economic Theory, Cambridge: Cambridge

University Press

Wolff, Edward N. 2012. "The Asset Price Meltdown and the Wealth of the Middle Class,"

NBER Working Paper 18559.

Figure 2: Real income Flows for the bottom 99% of US households, scaled to the national income and product accounts.

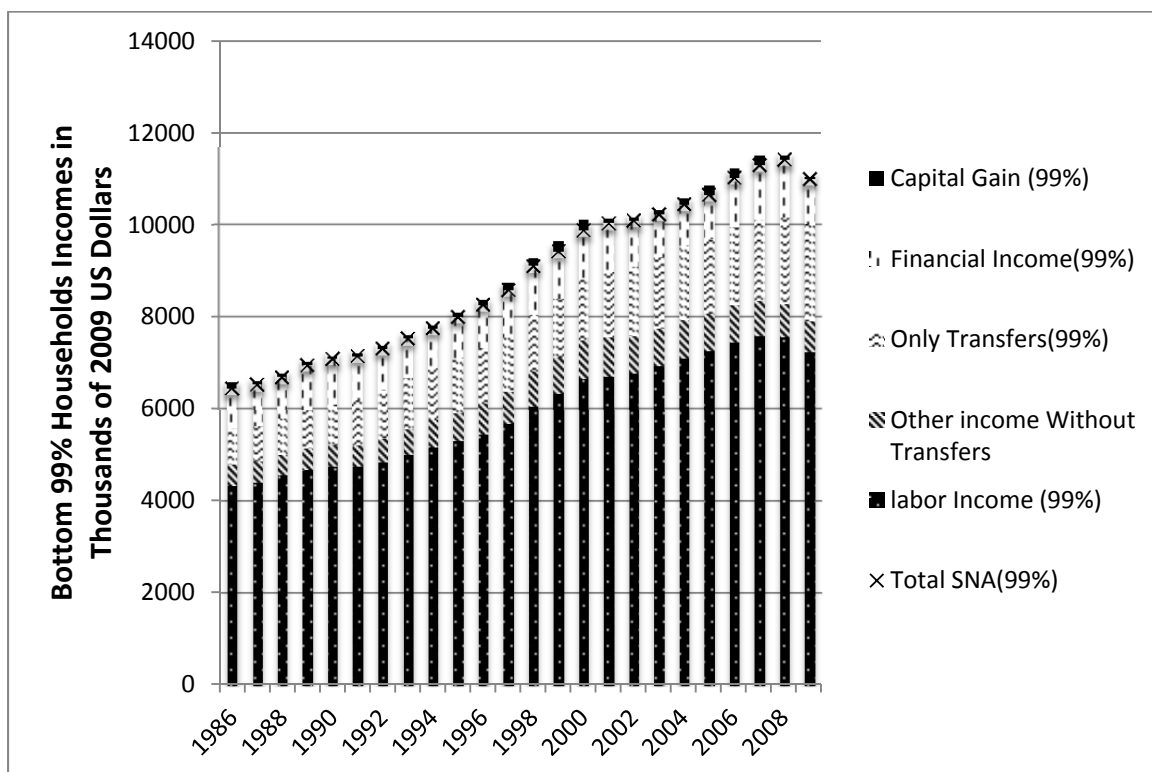


Figure 3: Simplified social accounting matrix for an economy with “capitalists” and “workers.”

	Costs	Workers	Capitalists	Business	Int. & Div.	Investment	Totals
Outlays		C_w	C_c			I	X
Workers							
Wages	$\psi_w X$						Y_w
Financial					T_w		
Capitalists							
Wages	$\psi_c X$						Y_c
Financial					T_c		
Business							
Profits	πX						Y_b
Int. & Div.				T_b			Y_f
Macro Balance		S_w	S_c	S_b	0	$-I$	0
Totals	X	Y_w	Y_c	Y_b	Y_f	0	

Figure 4: Balance sheets for all households and business

Households

$$P_e E \quad D_h$$

$$\Omega_h$$

Business

$$K \quad P_e E$$

$$D_b$$

$$\Omega_b$$

Figure 5: Net business saving, business depreciation, and household capital gains

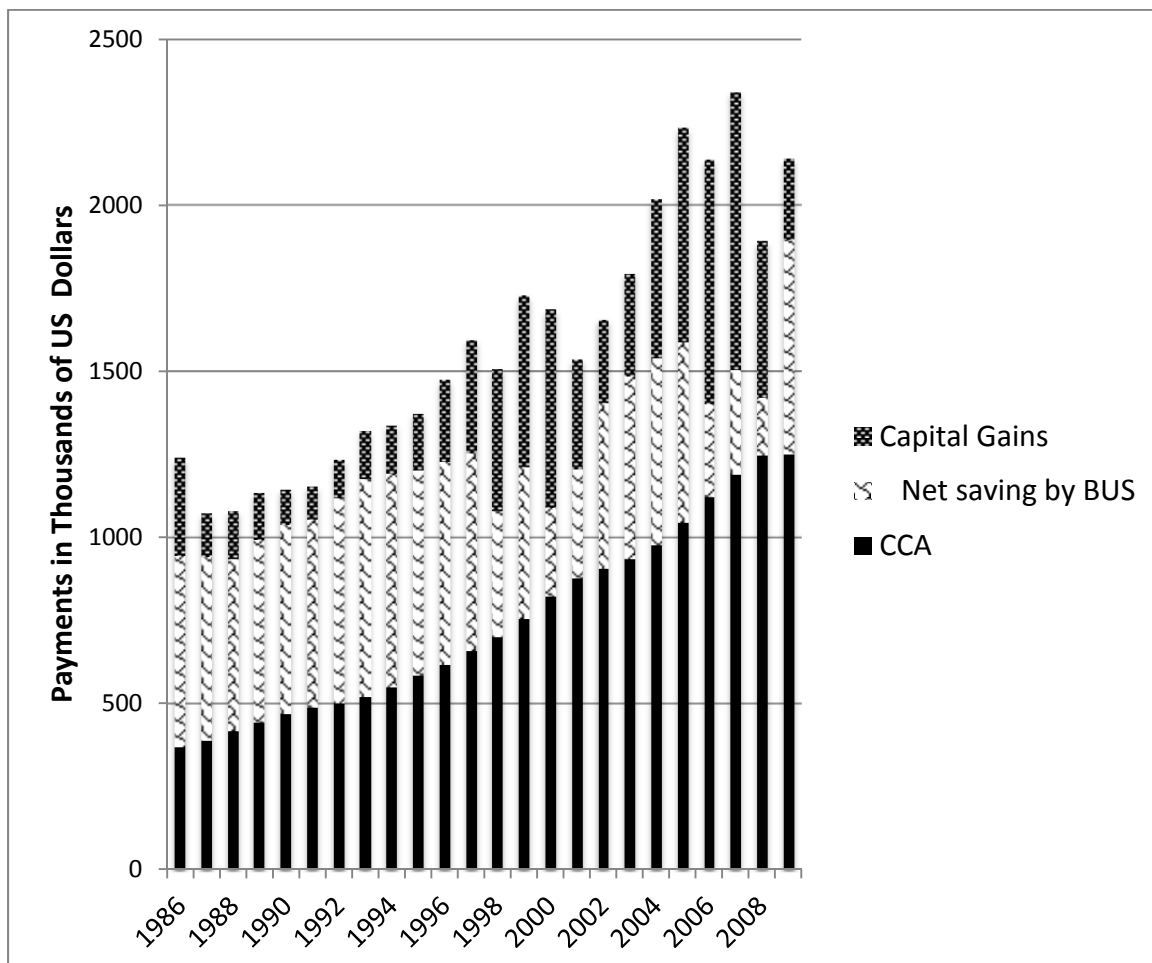


Figure 6: US assets (-) vs. liabilities (+) divided into capital stock, bonds and equity, and net worth by sector and household income groups, 2012

Levels in US\$ billions

	Capital	Bonds	Equity	Net worth
All HH	-16312.3	-23769.1	-28960.5	69041.9
Lower 80%	-3154.7	-3176.8	-1332.2	7663.7
Upper 20%	-13157.6	-20592.3	-27628.3	61378.2
Lower 99%	-11923.1	-15909.8	-16768.1	44601.1
Upper 1%	-4389.2	-7859.3	-12192.4	24440.8
Firms	-19903.3	1774.7	29482.6	-11354.0
Gov't	-12508.0	16862.8	-279.9	-4074.9
Finance		-5131.6	-1047.2	6178.8
R.O.W.		3175.3	805.1	-3980.4
Col. sum	-48723.6	-7087.9	0.1	55811.4

Sources: Assets, liabilities, net worth from Financial Accounts (Federal Reserve, 2014); capital stock from Survey of Current Business (October, 2013), household groupings computed based on Wolff (2012).