A Simulation of Income distribution based a Marxist based Accumulation model: Projection of Future Trends

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Abstract

This paper discusses how our web interactive macroeconomic Marxian based model can be used to estimate the division of the value of social production into streams of income to capitalists, productive and unproductive workers. The original model provided a means of estimating the gross value of aggregate product of the productive sectors. The original model decomposed this aggregate value into surplus value, variable capital and constant capital for the US for the year 2000. This value decomposition suggests an income distribution among the Marxian categories of capitalists, productive workers and unproductive workers. The value of constant capital flowing though the money of circuit of capital (raw materials, auxiliary materials, and semi-finished goods – all net of depreciation) is interpreted not only as value transferred to the value of output of productive capital but as a portion of the income flows to the different classes. The value of this constant circulating capital can be interpreted under some restrictive assumptions as being equal in magnitude to a major part of total revenue that goes to unproductive labor. Using the definition and procedures of Shaikh and Tonak, the number of unproductive workers can be estimated. Data from the Bureau of Census, the Bureau of Labor statistics and the Bureau of Economic Analysis allows us to approximate the number of households in the categories of capitalists, productive and unproductive workers. The model results, therefore, imply an income distribution among these categories. The government agency data and our interpretation of Marxian class definitions suggest the number of households in various Marxian class categories. Our study assumes that all households belong totally to one category. In fact, households will often be of mixed categories but this means only that the class tensions and conflicts will exist within families. The assumption of pure category households has the advantage of highlighting potential class conflict regardless of how they may be hidden by other social classifications. The advantage of the model is that given the initial conditions of production generating surplus value and value, we can determine the implications for a four class income distribution. Most unproductive workers would be what many consider the middle class. Based on changing conditions of production (length of working day, intensity of labor, number or productive workers, number of working days per year etc) income distributions can be projected forward. The model and its implications for income distribution will be demonstrated with a computer simulation at the conference.

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Introduction.

Motivation

We have developed a model that can be used to estimate GDP based on the factors that determine value and surplus value within the Marxist theoretical framework. The model was developed to satisfy our curiosity about the ability of Marxists concepts combined in a computer simulation model to more precisely analyze macroeconomic issues. Our project is extended in this paper to consider income distribution. We have been extending the model so that it can provide timely analysis of linkages between the traditional determination of surplus value and value and macroeconomic aggregates such as GDP, growth and unemployment. Here we focus on the implications of the model for income distribution among the Marxian class categories of capitalists, productive workers and unproductive workers. Admittedly, we have our own interpretation of these categories.

Data has been used to provide approximate consistency tests at each stage in the model development. We believe that a more fully developed model can be used to make transparent the linkages between the conditions directly affecting the rate of surplus-value generation and income distribution and its trend.

Problem

The model we developed was able to simulate the decomposition of value into surplus value, constant capital and variable capital for the US for the year 2000. It is difficult to develop and evaluate emerging issues of political economic based on Marx in a timely manner without resorting to many generalizations. This leaves opaque many implicit assumptions which are important a Marxist theoretical framework based on several assumptions about the conditions of production. These conditions of production have implications for income distribution. The question that we consider is whether computer modeling and simulation offer a way to shorter the time for a complex analysis, to make explicit assumptions concerning the conditions of production and increase the number of scenarios that can be considered in a given period of time when considering the linkages between the conditions of production and income distribution. A related question considered is whether useful information for that can contribute to understanding contemporary political issues.

Conjecture

Our answer to the first question is that such modeling can generate these results but that it will have to be developed incrementally. To second, question our answer is we believe the answer is that the results can be useful quantitative links between how struggles over the conditions of production impact of income distribution among the classes.

Objectives

We organized our objectives around answering the previous two questions. We set up seven objectives for our enquiry. The first would be to set up how the model would project production of value to the year 2015. The second objective is to identify the benchmark composition of the US population into various classes. Next we estimate the income per capita in each of the various class categories based on value produced. The next objective is to establish how changes in the conditions of production impact on income distribution. The Fifth objective is projecting the conditions of production and value production to 2015 for the U.S. The next objective is to establish the implied income distribution. The final goal was to assess the class contradictions that emerge as a result of these trends.

Procedures

Our approach must start with the use of the model to estimate value production. We estimate the value composition of capital from the year 2000 to 2009. Then, we categorize the US population by class for the year 2000 and project it to 2009. Based on the value composition of output and the class composition of population we simulate the income distribution in the US by class. To examine the impact of the conditions of production on income distribution we alter the length of the working day, the intensity of labor and the number of working days for productive labor and evaluate the impact on the income distribution by class. We then project the conditions of production and income distribution for the US to 2015. Finally we assess what the exercise has revealed quantitatively about the class conflict over conditions of production and the implications for income distribution.

Expected results

We expect to have developed a procedure that will be made accessible to the internet. One can experiment alternative scenarios associated with alternative conditions of production and project quantitatively the income distribution that might result. The model is important in being a tool for making clear the implications of how political struggles over the conditions of production in this framework of analysis result in potentially rising value production but rising exploitation and increasing class tensions.

Background, theory and procedures

Development

The original model is based on thriteen equations.[1] It is a simulation model. The model is linear. It is not specified in the matrix form of an input-output model. It was developed for the internet and to be interactive using perl scripts with html interfaces. It has only one productive sector or department. The initial model had 12 input parameters and generated 8 output tables. A primitive finanical sector has been added. The model now has 39 input parameters. It produces 15 tables of output.[2]

Theory

Modeling of economic aggregates using Marxian concepts of value and surplus value have not produced results that have been totally comparable to values of aggregates of Gross Domestic Product produced by the National Income and Product Accounts reported by the Bureau of Economic Analysis (BEA).[3] Shaikh and Tonak define the

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[1] For details of the model see: Victor Kasper, Jr. "Estimating Gross Domestic Product with Surplus Value." *Research in Political Economy* 20 (2002).

[2] A discussion of the larger model was provided in different versions of two similar presented papers. Victor Kasper, Jr., "An Analysis of the Financial Crises of 2008-2009," Fourth Cross Border Post-Keynesian Conference, Buffalo, NY, October 2009 and Victor Kasper, Jr., "A Simulation Model of Marxist Accumulation: An Analysis of the Financial Crises of 2008-2009," Paper presented at the Rethinking Marxism Conference, Amherst, MA, November 2009.

[3] Shaikh and Tonak found that the Marxian Total Product was ". . . roughly 82% of the IO measure of gross product GP, but about 1.5 times larger than the conventional measure of GNP. Marxian gross final product GFP*, on the other hand,

Marxian aggregates in terms of both NIPA data and Input-Output data. Marx defined total value of product as c + v + s.[4] He refers to the new value created as the new value product or the annual value-product or s + v.[5] Our model makes use of benchmarks for used to calibrate the model provided by the work of Shaikh and Tonak. We had a different approach and purpose than Shaikh and Tonak. Whereas Shaihk and Tonak were concerned with mapping Input-output data and NIPA data into Marxian categories, we were concerned with developing a Marxian theoretical approach to estimating macroeconomic aggregates by starting with the theoretical determinants of the value. We assume these determinates are input parameters in the model. We identify empirical estimates of these value or proxies. The model is then be used to estimate the national aggregate values we consider. We validated the model by examining estimated aggregates that result by using estimated input parameters in this theoretical model.[6] Some of the estimates of the input parameters and were based on the work of Shaikh and Tonak. We also needed an initial estimate of the rate of surplus value. The rate of surplus value is an output of the model. However, we needed a procedure to estimate implies values inputs to our model which are not easily observed. A benchmark value for surplus value would imply an approximate value for these inputs. We used a benchmark value for the rate of surplus value selected from Shaikh and Tonak. Our base model is primarily concerned with demonstrating the relationship between conditions of production such as the length of the working day, intensity of labor, productivity of labor, the number of working

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is about 15 % smaller than GNP." Shaikh and Tonak, *Measuring the Wealth of Nations* (NY, NY: Cambridge University Press, 1994), 221.

[4] He also refers to it as the value of annual product. We interpret what Shaikh and Tonak call the Marxian Total product as the total annual product of Marx. Karl Marx (Frederick Engels, Ed.), *Capital - a Critique of Political Economy (Unabridged) - the Process of Circulation of Capital*, 1967 English edition. First published in 1867 in German ed., 3 vols., vol. 2 (New York, NY: International Publishers, 1967), 377 and 430.

[5] Ibid., 376.

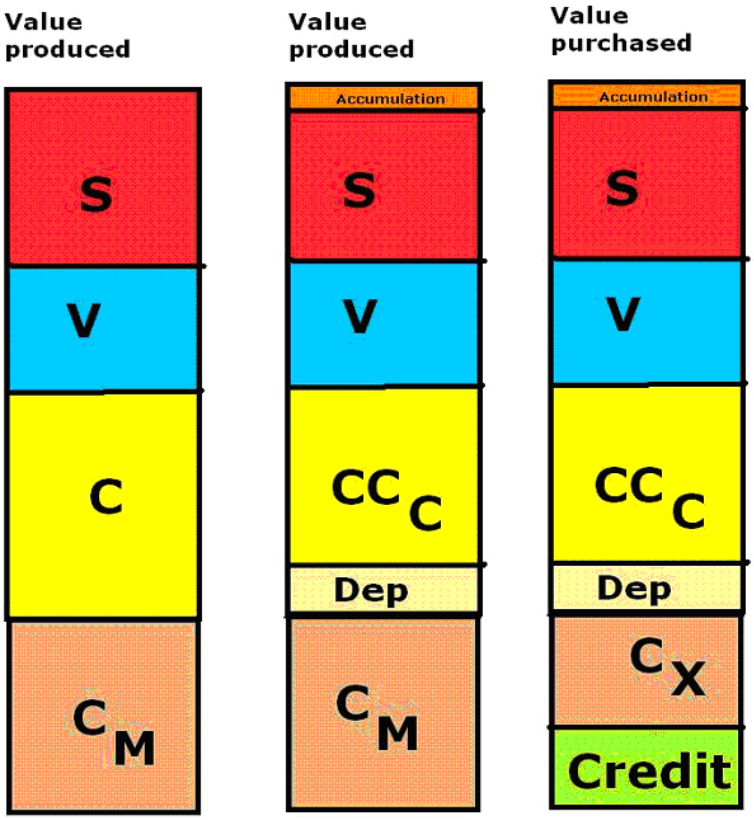
[6] Victor Kasper, Jr., "Estimating Gross Domestic Product with Surplus Value," *Research in Political Economy* 20 (2002), Victor Kasper, Jr., "Estimating Constant Capital and GDP with a Marxian Simulation Model," presented at *Marxism and the World Stage* (University of Massachusetts, Amherst, MA. : 2003); Victor Kasper, Jr., "A Simulation Model of Marxist Accumulation in a One Department Macroeconomic Model of the United States." in *Rethinking Marxism* (University of Massachusetts, Amherst, MA.: 2003); Victor Kasper, Jr., "Progress in the development of an Internet Simulation Macro Model based on the Marxist labor theory of value - Considerations for a Financial Sector." Paper presented at the Eastern Economics Association, in Boston, MA, March 7, 2008.*d Stage* (University of Massachusetts, Amherst, MA. : 2003).

days per year and the number of productive workers and aggregate estimates of surplus value and the Marxian concept of the value of total product of the productive sector. Our initial model proved to be promising for future work and modifications that could address additional issues besides approximating GDP or the Marxian equivalent of it. One such modification was to explore the implications for income distribution.

Value of output Produced

The total output of the productive sectors in the Marxian framework includes surplus value, variable capital and constant capital (Exhibit 1).

Exhibit 1. Marxian Value Composition of aggregage output: Value produced and value purchased from revenue or credit.



Where:
S = Surplus value
V = Variable capital
C = Constant capital
C_M = Imports
Dep = depreciation
CC_C = constant circulating capital

Our model estimated on the value produced by productive sectors in the US for the year 2000 and then projected forward. The estimates were different form the Bureau of economic Analysis estimates by 15 percent. It turns out that if gross imports are added to our estimate, the total is within two percent of the BEA estimate.[7] Exhibit one is a

[7] This observation is anecdotal and not conclusive validation of the model or of how imports might be treated but it is suggestive. Theoretically trade between countries could be compared to exchanges between individual capitals. The purchase of inputs from other firms is for Marx the purchase of constant capital. In a sense the purchase of aggregate exports is the purchase of constant capital from abroad. We would have to make the assumption of the national economy to be likened to one large firm with imports acting as the purchasing agents of this firm. Marx or Engel's

depiction of value of output produced with imports depicted as one component of constant capital. Constant capital purchased domestically can be further decomposed into depreciation and circulating constant capital. If we assume that the capitalist system is dominant and we make the additional assumption that the value of non productive sectors generates its income for the surplus value produced by the productive sector, then the value that was value that was generated by the productive sector should near equivalent to the value of the final product estimated by the National Income and Product Accounts (NIPA) of the Bureau of Economic Analysis (BEA).[8] This is conjecture at this point with one anecdotal observation. In any case, it gives us one method of relating Marxian total value produced to GDP.

Revenues and Purchases

Revenues are interpreted as what capitalists spend on personal consumption; in addition they make purchases of capital (variable and constant). Variable capital in the social sense in this framework must be the labor time required to product productive labor.[9] Capital has income that must include surplus value and constant capital in the social sense. The constant capital is not new value but is continually transferred (as long as value is realized in sales). The value of output net of constant capital transferred is what capitalists and all other classes within society have to consume. These other classes would include unproductive labor, petit capitalists that hire no labor, unproductive government employees and those unable to work.[10]

The value of output purchased of the productive sectors under these assumptions must be equal to the revenues to capital, constant capital transferred and variable capital. Wages of the productive labor must be equal to the value of variable capital. The gross income all other classes must be equal to the value of surplus value and constant capital.

Estimates of these values based on the US for the year 2000 are indicated in

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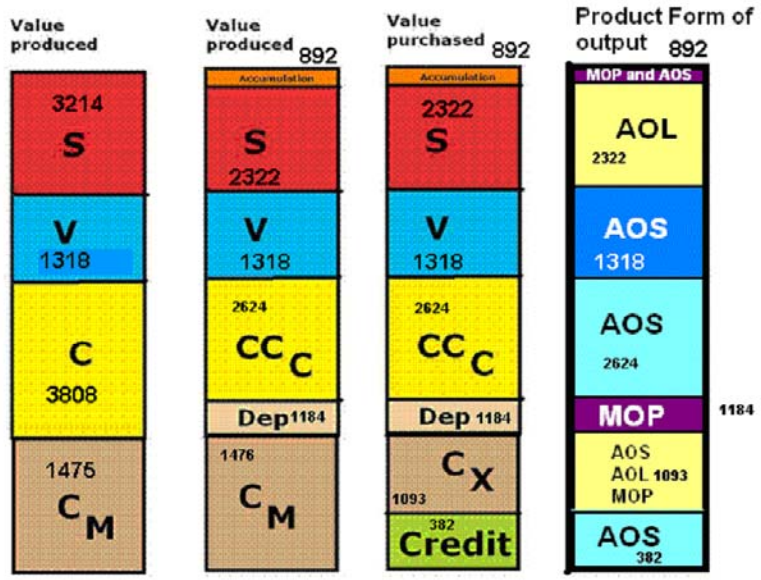
interpretation of him as editor makes analogy of the national economy to an individual capital in volume III.

[8] By unproductive sector, we mean unproductive so social surplus value.

[9] This would be true only in a long run sustainable situation.

[10] Again by unproductive we mean not productive of social surplus value. It does not mean unproductive of use value.

Exhibit 2. Estimates of value produced, value purchased and the value of the product form of output



Where:
AOL = Articles of luxury
AOS = Articles of subsistence
MOP = Means of production

Note numbers are in nominal billions of dollars per year for 2000 for the US

Exhibit 2. The total value of the productive sector estimated by the model for S + V + C excluding imports is $8,340 billion. Including imports from the NIPA estimates it is $9,814 billion for 2000 for the U.S. The model estimates the $8,340 billion for various conditions of production. All other numbers are obtained from the NIPA BEA estimates. The estimate of total value produced considering imports as part of constant capital is $9,815 billion. Productive labor must receive $1,318 billion. The value of all other output is distributed to other classes. This is equal to $8,497 billion. To get a better approximation of income distribution based on Marxist concepts some additional conjectures are made. Total wage disbursements for 2000 were $4,828 billion.[11] If we subtract from this the estimated value of productive labor, this leave an upper limit on unproductive labor of $3,513.7 billion. ($4,828 billion – $1,314 billion = $3,514 billion) This would be the maximum estimated amount received by unproductive labor under sustained conditions.[12] This would leave $4,987 billion for

[11] Department of Commerce, Bureau of Economic Analysis Website, "Table 2.2B. Wage and Salary Disbursements by Industry [Billions of dollars]," (last revised 12/22/2009) http://www.bea.gov/national/nipaweb/TableView.asp?SelectedTable=60&ViewSeries=NO&Java=no&Request3Place=N&3Place=N&FromView=YES&Freq=Year&FirstYear=2007&LastYear=2000&3Place=N&Update=Update&JavaBox=no (accessed January 11, 2010).

[12] We have a conjecture about an alternative way to estimate the income of nonproductive workers. We hypothesize that Nonproductive workers in a closed economy would have a gross income equal to circulating constant capital. This is estimated at $4,020 billion minus depreciation $1,184 plus borrowings from abroad used to purchase imports ($328 billion). This totals $3,218 billion. Thus, this second

capitalists and various non productive labor groups. Capitalists would receive in the form of interest, profit and rents the equivalent of $3,214 billion in surplus value.[13] The question is whether this can be refined further. To extend the analysis a bit further, we estimate the per capita income, per household and per earner income of each group for the year 2000. Making this extension requires an estimate of the number people, households and earners in each class category.

Class Composition of the Population

In our original model there were estimated to be 135 million people employed in the labor force. This excludes the unemployed in the labor force. There were 5.69 million unemployed in 2000 on average for the U.S.[14] Based on Shaikh and Tonak for 1989 there were about 36 percent employed in the productive sectors in 1989.[15] We initially used this percentage for the year 2000. This resulted in an estimate of 49 million employed in the productive sector. There were 106, 418 thousand households in the US in 2000.[16] There were 1.41 workers per household and an average household size of 2.6 people. The employed labor force was 135 million. This (135/ 1.41) means that 95.7 million households are represented in the labor force. 36% or 34.5 million of households would have been involved in productive labor while 64 % or 61.27 million households would have been unproductive labor. This assumes that all households had either productive or unproductive labor as earners. In realty there would be various mixes of earners within households as indicated by the stratification chart of Stephen Rose. This view of mixed households although realistic obfuscates the class contradictions within society. Class contradictions are present even if they reside within the household. Based on our estimates above, in 2000 there were 106, 418,000 – 95,700,000 = 10.738,000 with no wage earners. We assume these households were retired, unemployed, in prison, or

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approach to estimating wages of unproductive workers is $295.7 billion or 8.4 % less than the first method Department of Commerce, Bureau of Economic Analysis Website, "Table 5.2.5. Gross and Net Domestic Investment by Major Type [Billions of dollars]," (last revised 8/20/2009) http://www.bea.gov/national/nipaweb/TableView.asp?SelectedTable=139&ViewSeries=NO&Java=no&Request3Place=N&3Place=N&FromView=YES&Freq=Year&FirstYear=2000&LastYear=2008&3Place=N&Update=Update&JavaBox=no (accessed January 11, 2010).

[13] This would only be surplus value produced by domestic productive workers.

[14] Department of Labor, Bureau of Labor Statistics Website, "Series ID: LNU3000000, not seasonally adjusted (Unadj) unemployment level, number in thousands, 16 and over," http://data.bls.gov:8080/PDQ/outside.jsp?survey=ln (accessed January 20, 2010).

[15] Shaikh and Tonak, Measuring the Wealth of Nations, 1994, 333.

[16] Department of Commerce, Bureau of Census, "HINC-01. Selected Characteristics of Households, by Total Money Income in 2000," (last revised 12/13/2001) http://pubdb3.census.gov/macro/032001/hhinc/new01_001.htm (accessed January 11, 2010).

those in dire poverty or the extreme wealthy. We assume that these groups live by transfers or property income. For Marx, property income is a transfer resulting from exploitation at the point of production. There were 6,060,000 million Social Security Insurance Recipients in 2000. Assume that they were organized in 6,060,000/2.6 = 2.3 million households.[17] The unemployed included 5.692 million which are estimated to be organized into about 5.692/1.41 = 4.04 million households. 11.912 million households had no economic activity according to the census in 2000. 46.4 percent of households with no work activity held interest bearing assets. There were 6,094 thousand recipients of welfare in January 2000.[18] This would have made 6,094/2.6 = 2.34 million households on welfare. Let us assume we have 10.7 million households with no earned income with about 2.3 million of these represented by retirement households, 4.04 million unemployed households and another 2.34 million on welfare. That leaves 2.03 million households with no wage income. We will assume they are pure capitalists. They might be viewed as corporate board members who are not employees. We assume that they are spread out among industrial capitalists, money capitalists and landlords.[19] If we assume 4 million corporations with sizable employment and governing boards and about 12 board positions per board, then we have 48 million board members or about 34 million households who would be considered to have a member on a corporate board. About 50% of employment in 2006 was concentrated in firms of 500 + employees. If we assume that most of these were corporations, these represented about 18,100 firms or about 1,129 thousand establishments.[20] This would represent about 217,200 board seats. Due to interlocking directorates, there may be fewer than 217,200 people on these boards. It has been noted that, In 2001, for instance, although women held 678 board seats, these

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[17] U.S. Social Security Administration, Office of Policy Website, "Table 1.
Number of persons receiving federally administered SSI payments and amount of payments, by program category, age, receipt of OASDI, and state, December 2000"
http://www.socialsecurity.gov/policy/docs/statcomps/ssi_sc/2000/table01.html (accessed January 11, 2010).

[18] U.S. Department of Health and Human Services, (3/20/2007) Administration for Children and Families, "TANLF: Total number of Recipients," (last updated http://www.acf.hhs.gov/programs/ofa/data-reports/caseload/2000/2000_recipient_tan.htm (accessed January 11, 2010).

[19] We can assume that capitalists can have a variety of interests in property. Most probably have portfolio of property assets that include stock or equity, credit claims and real estate. They can be called industrial capitalists, money capitalists or landlords according the composition of theses portfolios. Commercial capitalists can be viewed as an adjunct of the industrial capitalists. The industrial capitalists would be considered active capitalists.

[20] Department of Commerce, Bureau of Census, "Number of Firms, Number of Establishments, Employment, and Annual Payroll - 2006," (last revised 12/13/2001)
http://www2.census.gov/econ/susb/data/2006/us_state_totals_2006.xls (accessed January 20, 2010).

seats were occupied by only 480 different women."[21] This would work out to 678/480 = 1.41 board seats per director. This would mean that these 212,200 board seats on 18,100 large firms would represent 48,118 different people or 34,126 households. Hunt and Sherman cite the issue of interlocking directorates noting that: "In 1965, the 250 largest corporations had a total of 4007 directorships, but these were held by just 3165 directors. Among these directors, 562 men each held two or more directorships, and 5 men held six each!"[22] This implies 1.27 directorships per director; somewhat lower than the more recent ratio for women among the Dow Jones 500 boards. In the 2005-2007 American community survey 3 year estimates, 111.609 million households were reported and only 27.978 million had interest, dividend or rental income. This would be about 25 % of households.[23] We can assume that much of this is concentrated in a small number of large capitalists. Thus, 2.03 million would be an underestimate of capitalist households represented as functional class. Since many in finance and upper level management such as CEOs are owners of large amounts of income earning assets, these are lumped in with unproductive labor. Since there are about 5 million firms with employees we assume at least 1.5 capitalists per unit of capital are lumped as unproductive labor or about 7.5 million.[24] Marx does not argue that workers should have equal incomes even under a socialist system or that some will not make substantial amounts based on their contribution to socially necessary abstract labor. The point is that capitalist may be able to extract more in wages from employment in companies that they have interest in than would otherwise be justified. Marx observes in Smith the following:

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[21] Lissa Lamkin Broome, *The Corporate Board Room Still a Male Club, 667.* Book Review. https://ddi.law.unc.edu/documents/bookreviews/thecorporateboardroom.pdf (Accessed January 20, 2010).

[22] E. K. Hunt and Howard J. Sherman, *Economics – An Introduction to Traditional and Radical Views* 6th edition, (NY, NY: Harper & Row, 1990), 308. They cite. John Blair, *Economic Concentration*, (New York, NY: Harcourt Brace Jovanovich, 1972), 76.

[23] Department of Commerce, Bureau of Census, "HINC-01. Selected Characteristics of Households, by Total Money Income in 2000," (last revised 12/13/2001) http://pubdb3.census.gov/macro/032001/hhinc/new01_001.htm (accessed January 11, 2010).

[24] As a reality check, the top 5 % of the population had incomes of $145,220 per household or greater in 2000. 10 % of 106,418 thousand is 10.6 million. Not all of these will be capitalists or have income generated from property. Department of Commerce, Bureau of Census, "B19054. Interest, Dividends, or Net Rental income in the Past 12 Months for households – Universe: Households data set: 2005-2007 American Community Survey 3-Year Estimates," http://factfinder.census.gov/servlet/DTTable?_bm=y&-state=dt&-ds_name=ACS_2007_3YR_G00_&-CONTEXT=dt&-mt_name=ACS_2007_3YR_G2000_B19054&-redoLog=true&-_caller=geoselect&-geo_id=01000US&-geo_id=NBSP&-format=&-_lang=en (accessed January 20, 2010).

Adam Smith* has already comprehensively shown that the numerous differences in the exploitation of labour in various spheres of production balance one another by means of all kinds of existing compensations, or compensation accepted as such on the basis of current prejudice, so that they are merely evanescent distinction and are of no moment in a study of the general relations.[25]

An important observation in the above citation here is that Marx recognizes current prejudices and impacting on income differences. There is a further discussion of wages differences on these pages. Mostly the discussion indicates that he is not in capital focusing on local frictions that generate wage disparities but is focusing on a general analysis of capitalist production.

However, he did note that under capitalism, wage and salary differentials may not always represent the socially necessary payment. Managers and executives may receive more than would be justified to replicate their function under capitalism. So we may be talking about 10.6 million households whose income is primarily capitalist. (Rent, interest or profit dominant) Some of the unproductive labor income will be derived from profits, interest and rents by virtue of the power that allow them to obtain more than what under other conditions would be limited by an alternative method of determining what is socially necessary.

A summary of our estimate of the class composition of the US in 2000 is indicated in Exhibit 3.

Exhibit 3. Benchmark estimate of the Class composition of the U.S. population 2000.

[25] Karl Marx, Edited by Frederick Engels. *Capital – The Process of Capitalist Production as a Whole*. Volume III. Unabridged. (NY, NY: International Publishers, 1967), 142.

Role	Number of Households (million)	Number of earners (million)	Number of people (million)
Capitalists	7.000	9.870	18.20
Unproductive labor	61.270	86.048	159.02
Productive labor	34.500	48.645	89.00
Other	3.648	5.144	9.48
Total	106.418	150.049	276.69
Calculations are based on the discussion above. These are only rough approximations. Household size was estimated at 2.6 for all types of households while the number of earners per household was estimated at 1.41 per household. These values will probably vary by household category. Source: Census, BEA and BLS data, Circa 2000			

As can be seen we estimate capitalists to represent 6.6 percent of the population. Productive workers represent about 32.2 % of the population.

Income per capita, Household and Earner

Our model estimated the total value of variable capital at $1,314 billion. This amount divided by 49 million is approximately $27,100 per productive worker or $38,200 per household. We estimated the income of non productive workers (unproductive workers and other) as a residual. This represented $4,303 billion. This was the value of imports and domestically purchased constant capital. This would be the estimated amount received by 64.9 million households or 91.18 million earners representing unproductive labor and other. On a per earner basis this represents $47,206. We were unable to differentiate the incomes of other and unproductive labor. This means that there were about 64.9 million households that were primarily non productive receiving a household income of $66,302 per household. Their income per earner was $47,206.We have 34.4 million households where the earners are primarily productive labor with household income of

$27,100 per earner or $39,203 per household. We assume that about 7 million households are primarily capitalist. We will assume that their total income is $3,414 billion or about $487,714 per household. Our results are summarized in Exhibit 4.

Exhibit 4. Estimated Distribution of income by Class					
Function	Number of Households (million)	Value Received as income ($ billions)	Per earner ($/earner)	Per capita ($/person)	Per household ($/household)
Capitalists	7.000	$3,414	$345,896	$187,583	$487,714
Unproductive labor	61.270	$4,062	$47,206	$25,543	$66,302
Productive labor	34.500	$1,318	$27,097	$14,809	$38,203
Other	3.648	$242	$47,206	$25,543	$66,302
Total	106.418	$9,818	$65,431	$35,483	$92,259
Calculations are based on the discussion above. These are rough approximations. Source: Census, BEA and BLS data, Circa 2000					

We have yet to extend the analysis to the 2009 period and project it to 2015. To do so we have to update a number input parameters and values required to calibrate the model used to simulate the conditions of production. These parameters include: 1) the length of the working day, 2) the intensity of labor; 3) the number of working days per year; 4, the earnings per hour of productive workers; 5) the productivity of labor in subsistence goods, 6) an index of the subsistence real wage and 7) reckoning name for money (market price of gold). Estimates of these key input parameters and calibrating factors estimates are provided below. (Exhibit 5). Further development of this data is required to project our income distribution impacts of the conditions of production.

Exhibit 5. Estimates of input parameter that will be used to project value estimates forward.								
	LOWD	IOL	NOWD	L	EPH	POL	SB	RNM
2000	8.094	1	214	49.0	15.53	0.45	1.06	279
2001	*8.080	1	*215	*49.3	*16.00	*0.46	1.07	271
2002	*8.070	1	*216	*49.6	*16.50	*0.48	1.08	309
2003	*8.060	1	*217	*49.9	*17.00	*0.49	1.09	363
2004	*8.050	1	*218	*51.2	*17.50	*0.51	1.10	409
2005	*8.040	1	*219	*51.5	*18.00	*0.52	1.11	444
2006	*8.030	1	*222	*51.8	*18.50	*0.54	1.12	603
2007	*8.010	1	*223	*52.0	*19.00	*0.55	1.14	695
2008	7.950	1	224	52.3	19.65	0.57	1.15	871
2009	*7.940	1	*225	*52.3	*20.00	*0.59	1.16	934
Source: *Extrapolated								
LOWD = length of working day, IOL = intensity of labor, NOWD = number of working days per year, L = number of units of labor power, EPH = Earning per hour per worker, POL = Productivity of labor in subsistence goods, RNM = reckoning name of money (price of gold)								

Conclusions

We set out to achieve seven objectives. We how our model can be used to estimate the value and value composition output given selected conditions of production. We then discussed how the value composition of output could be considered comparable to GDP. We then discussed some conjectures about how this composition of output would be distributed to the various classes. We then developed a class distribution of income for the US for 2000. The results indicated that 38.4 million households representing the collective productive worker had house income of $38,200 per year will seven million households representing the collective capitalist had household incomes of $487,700 per year. It must be remembered that the labor incomer represents labor time sold for wages while the capital income represents the interest and rent of idle capital and the profits of active capital for directing labor and overseeing the direct appropriation of unpaid labor. In addition, estimates of the values of input parameters and data needed for model calibration were estimated to bring the model and ability to project income distribution impacts to 2009 were developed.

Recommendations for future research

The research has yet to complete a number of other objectives. The updated value estimates of the value composition of capital are yet to be done. Once these estimates are complete, the transformation of these values into a class distribution of income needs to be developed. The conditions of production will then be considered for three different scenarios to test the model. The results of the project will then be worked into an interactive internet model. Some of this work should be completed by the time of the paper presentation in July.

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