CONSTRUCTION OF SERIES FOR THE LONG-RUN ANALYSIS OF THE U.S. ECONOMY

Profitability, technology of production and income distribution

Sergio Cámara Izquierdo

scamara@correo.azc.uam.mx

Área de Investigación *Sociedad y Acumulación Capitalista*

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1. INTRODUCTION

The main purpose of this paper is to present the construction of macroeconomic series for the Marxian-classical long-run analysis, based on profitability, technology and distribution trends, of the U.S. economy. This presentation includes: i) a description of the estimated series and the sources of information, (section 2) ii), a review of the methodology employed (section 3), iii) a depiction of the detailed calculation carried out (section 4), and iv) a portrayal of the results (section 5). An appendix of tables encompassing all the series employed in the calculations is annexed. The dataset associated with this paper is available by request.[1]

2. DEFINITIONS AND SOURCES

2.1 Flows and stocks

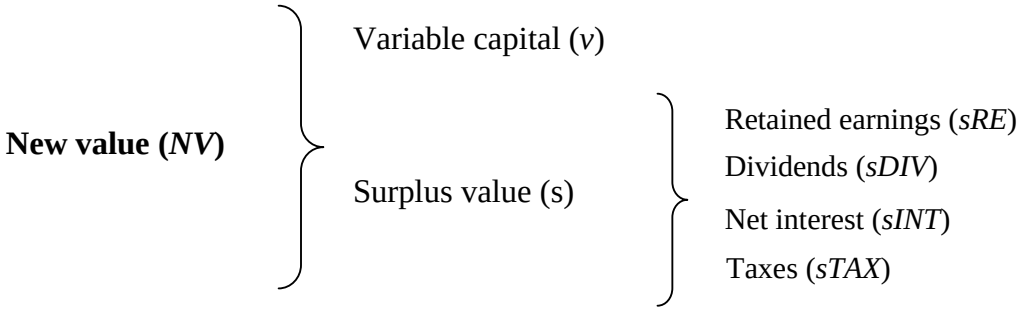
According to the labor theory of value, the long-run dynamics of capitalist economies depends mostly on capital profitability, which itself can be decomposed into two main components: income distribution and technology of production. The rate of profit, the most salient measure of profitability, is defined as the ratio of profits to capital advanced. Profits are a flow variable defined as the difference between the new value created and the labor cost, while capital is a stock of value advanced in production in the form of productive, commodity and money-capital.

The measure of income distribution of requires a calculation of the new value created by an economy in a period and its division among classes and forms of valorization. We distinguish between the primary distribution of new value (*NV*) between variable capital (*v*) and surplus value (*s*), and the secondary distribution of

[1] The dataset can be requested to the author: scamara@correo.azc.uam.mx.

surplus value among various forms of profit: retained earnings (*sRE*), dividends (*sDIV*), net interests (*sINT*) and taxes (*sTAX*). The relation between the flows calculated in this paper is displayed in figure 1:

Figure 1. Flows and income distribution



On the other hand, the measure of the technology of production and the rate of profit needs the calculation of capital. Given the data availability, we restrict ourselves in the paper to the calculations of fixed productive capital (*Kf*). Therefore, circulating productive capital and the other forms of capital –money and commodity-capital– are disregarded.

2.2 Data sources

The only two data sources employed in this work, both from the *Bureau of Economic Analysis* (*BEA*), are the following:

- *National Income and Product Accounts* (NIPAs).
- *Fixed assets* (FAs).

The NIPAs are employed for the calculation of income flows. The FAs data source provides the information for the calculation of fixed capital assets. The NIPAs embrace the period from 1929 to 2007 for most of annual series, while the FAs provide information for the period 1925-2007 for data on stocks and the period 1901-2007 for data on flows. As a consequence, the dataset calculated in this paper covers the period 1929-2007.

3. ESTIMATION METHODOLOGY

There are theoretical controversies regarding the adequate definition of both flow and stock Marxian variables and technical and practical difficulties associated to the empirical measurement. As a consequence, the most important aspects of the methodology employed for the construction of the series for the Marxian-classical long-

run analysis of the U.S. economy are presented in this section.[2] The accounting principles rest on Marx's concept of productive labor, which is introduced in section 3.1. Then, the delimitation of the capitalist sphere of production within the NIPAs is analyzed in section 3.2. Section 3.3 is devoted to the analysis of the imputations made in the NIPAs and their attachment to the labor theory of value.

3.1 Productive labor

The construction of macroeconomic series for economic analysis must rest on some conception of economic activity and its measurement. This conception is generally comprised in the notion of productive labor. As argued in Cámara (2008), the concept of productive labor is radically different in orthodox theory than in the Marxian-classical tradition. One the one hand, orthodox theory defines production in a wide sense, as creation of goods and services from a material-physical perspective. However, this extensive definition is unpractical for the measurement of economic activity and alternative practical criteria are established in the orthodox systems of national accounts. These criteria trade off between a comprehensive accounting of the creation of use values and a pragmatically restricted set of use values.

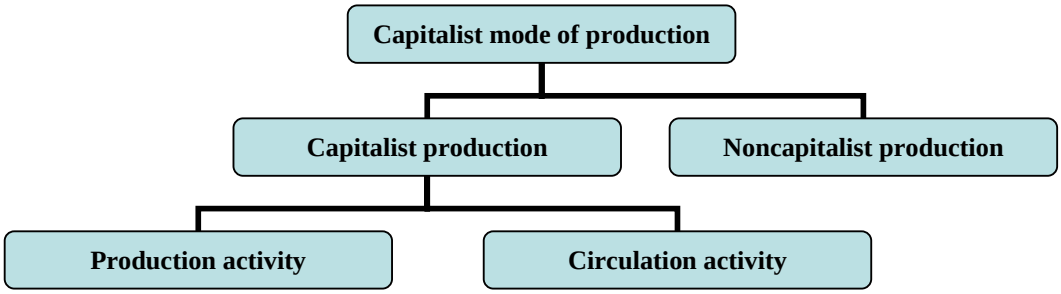
On the other hand, the labor theory of value holds an explicit notion of productive labor founded on its socially specific conception of production; only the restricted set of use values produced under capitalist relations of production must be accounted as creation of value (and surplus value). Although this limitation impedes an analysis of welfare based on this concept, it is a useful stand for analyzing economic dynamics in capitalism. Therefore, a Marxian-classical economic analysis must adequate the macroeconomic magnitudes of the orthodox national accounts to the theoretical foundations of the Marxian value theory.

Nevertheless, Marx's concept of productive labor has been subjected to enduring controversies within the Marxists literature. Therefore, a clarification of the use of this concept in this paper is needed. In Cámara (2006), the theoretical content of the concept of productive labor is largely discussed around the two profound historical debates occurred in the literature. In order to sketch briefly this discussion around the debates, it is useful to distinguish two levels in the definition of productive labor, sketched in

[2] A more general and comprehensive methodology for the measure of Marxian-classical analysis of the capitalist economies, applied to the Spanish economy, can be found in Cámara (2003).

figure 2. The first level, related to the old debate, makes the distinction between capitalist and noncapitalist forms of production. Concretely, labor that fails to fulfill any of the two requisites of capitalist labor –that is, being wage labor and being intended for sale– is unproductive of value and surplus value. For example, the production of domestic and independent workers and government production must be kept off of Marxian macromagnitudes. The first debate can be deemed as surpassed in literature and helped to rule out incorrect definitions of productive labor that did not rely on the capitalist content of labor but on the materiality of labor or the use values it created.[3]

Figure 2. Two levels in the distinction of productive and unproductive labor



The second level relates to the current debate and distinguishes the production and circulation labor within the capitalist sphere of production. This distinction is founded on the division of the process of capital production as a whole into a production and circulation sphere; in the latter, there is not value and surplus value creation, but value only changes its form of appearance. The controversy emerges as a consequence of the difficulties associated to the allocation of the different labors to the production or circulation sphere. Mainly, there are two conflicting stands: an extensive classification of branches of production into the circulation sphere (mostly, trade and finance) and an abandonment of the distinction, regarded to be inoperative.

In Cámara (2006), it is argued that both stands are ill-founded because they rely on a use value criterion, opposed to the social content of the notion of productive labor. Given the recent *terciarization* of the economies, the first stand also portrays an economy with a rising participation of circulation labor, which is at odds with the foundations of the labor theory of value; the accumulation process is depicted by a

[3] These incorrect definitions can be classified into three groups: the physicalist, the evaluative, and the reproductive definition. (Cámara, 2006: 59-60*n*)

sound process of surplus value creation but a voracious process of circulation that absorbs unproductively the surplus value created. On the other hand, the abandonment of the distinction of the second stand also negates the role of unproductive circulation labor.

This distinction, though, can be made operative if founded on a value, rather than use value, criterion. This foundation would require a profound microeconomic research and classification of the labors of the different branches of production. To avoid this practical difficulty, it is possible to assume an alternative macroeconomic hypothesis in the empirical research: the participation of circulation labor is fairly constant in the long term and, consequently, the circulation labor does not need to be estimated. (Cámara, 2003, 2006 and 2007) Under this hypothesis, the Marxian macroeconomic variables would suffer from a bias in their level, but not in their trend.

Summing up, the notion of (value) productivity of the labor theory of value demands to isolate the noncapitalist and the circulation activities of the systems of national accounts in order to arrive to the Marxian categories. However, the assumption of the previous macroeconomic hypothesis facilitates this task, limiting it to the identification of the noncapitalist sphere.

3.2 The capitalist sphere

As settled above, the labor theory of value makes a strong distinction between capitalist and noncapitalist spheres of production. Although the NIPAs do not follow this distinction, they divide the total economy 'by the type of product, by the sector, by the legal form of organization, and by industry.' (Seskin and Parker, 1998: 40) Although there is not a straight correspondence between the NIPAs classification and the spheres of production of the labor theory of value, the sectoral and legal classification can be used as a good proxy. First, the NIPAs classify economic activity into three major sectors: *businesses, households and non-profit institutions,* and *government.* (McCulla and Mead, 2007: 14) The last two must be classified as noncapitalists sectors, while the *business* sector, despite comprising parts of the noncapitalist sphere, is mostly a capitalist sector.

The *household* and *government* sectors must be considered as noncapitalists sectors because their production is not intended for sale and profit-making purposes. On the one hand, the value added by *households and non-profit institutions* limits to 'three different types of output: The rental services provided to homeowners by owner-

occupied housing, compensation paid to domestic workers, and nonprofit services that are provided to households.' (*ibid*: 16) The first one consist of an imputation which does not imply an actual labor process,[4] the second one comprises the domestic wage labor that it is directly consumed, while the third one implies mostly an imputation for rental value of nonresidential fixed assets owned by nonprofit institutions and the compensation of employees of their unsold services provided to households. On the other hand, 'gross output for general government is measured by the expenditures that are made to provide goods and services for public consumption' (*ibid*: 19), that is, 'the sum of compensation of employees, purchases of intermediate goods and services, and CFC.'[5]

The *business* sector 'engages in the production and sale of goods and services for profit, or at least for a price that approximates the costs of production.' (McCulla and Smith, 2007: 6) This sector is further decomposed according the legal form of organization between *corporate* and *noncorporate* businesses, and *corporate* businesses is further disaggregated into *corporate nonfinancial* and *corporate financial* businesses. Although the *business* sector is constituted primarily by capitalist enterprises, there are several exceptions. First,

> 'The sector comprises all for-profit corporate and noncorporate private entities and certain other entities that are treated as businesses in the NIPAs, including mutual financial institutions, private noninsured pension funds, cooperatives, nonprofit organizations that primarily serve businesses, Federal Reserve banks, federally sponsored credit agencies, and government enterprises. Government enterprises are government agencies –such as the U.S. Postal Service or state government-run utilities– that cover a substantial portion of their operating costs by selling goods and services to the public.' (*ibid*)

Although it is difficult to establish the capitalist nature of these other entities, it is contended that government enterprises are not capitalist enterprises, while the other

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[4] According to the NIPAs, 'the services provided by owner-occupied housing must also be counted in GDP. Otherwise, the value of GDP would change every time a housing unit switched between tenant occupied and owner occupied.' (McCulla and Mead, 2007: 16)

[5] Interestingly, the NIPAs consider the accounting of the CFC 'a partial measure of the services of government capital.' (McCulla and Mead, 2007: 19) Actually,

> 'BEA recognizes that the inclusion of a measure of net operating surplus in the production account for general government would improve consistency within a full set of national accounts; this practice would also involve choosing a model and using independent source data to estimate the value of a net return to fixed assets. Since the advisory group that has been tasked to recommend updates to the SNA has called for research on to how to measure such a net return in a set of national economic accounts, the production account for this sector presently only includes a measure of CFC, which is an incomplete measure of the cost of capital services derived from such goods.' (*ibid*)

corporate entities are. There are two reasons for this. First, most of these entities are required to file Federal corporate tax returns. Instead, government enterprises intend to cover costs and their current surplus is often negative. Secondly, the NIPAs provide disaggregated data for *government enterprises*, but they do not provide such data for the other corporate entities.

A second exception relates to for-profit businesses that cannot be considered as capitalist since no capital-wage labor relationship takes place, specifically, the production of independent workers and family-owned businesses.[6] These businesses are comprised in the *noncorporate business* sector and, specifically, in the *sole proprietors and partnerships* subsector, which includes the activity of self-employed persons who hire or not wage labor, and their income is accounted as proprietors' income. The NIPAs do not give information about the number of self-employed persons who do not hire wage labor, making it difficult to gauge the noncapitalist sphere within the subsector in order to deduct it. Alternatively, our treatment of these noncapitalist businesses consist in dividing the proprietors' income of the self-employed persons into equivalent compensation of employees –treated as variable capital– and profits –treated as surplus value–.[7] In section 4.1, a detailed exposition of the treatment of this subsector is provided.

Finally, the *other private business* subsector within the *noncorporate business* sector comprises 'the income earned from the rental of properties by landlords who are not sole proprietors or associated with a partnership or corporation and of the royalties received by persons from patents, copyrights, and rights to natural resources.' (McCulla and Mead, 2007: 15) Given that our measure of capital excludes residential fixed assets, the residential rental income of this subsector is excluded.

The sectoral and legal form of organization classification of production of the NIPAs allows for a presentation of the estimated series in five different aggregation levels: business (*B*), corporate business (*CB*), corporate nonfinancial business (*CN*),

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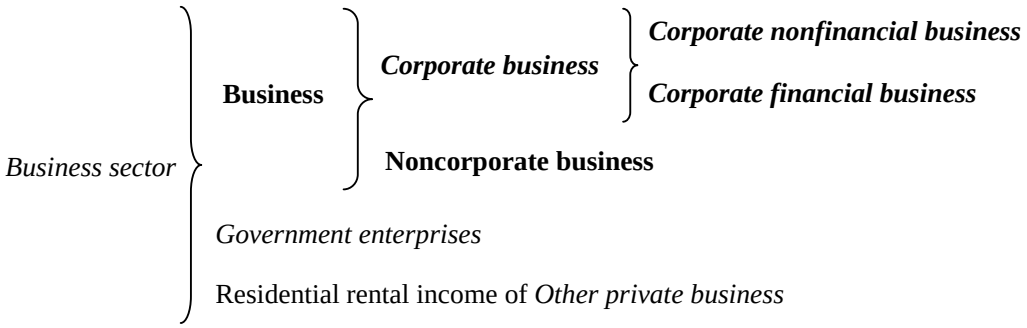
[6] Therefore, from a Marxian perspective, they must be simply considered for-income businesses.

[7] In Cámara (2003: 212-9), it is argued that the income of self-employed persons cannot be decomposed between variable capital and surplus-value because there is no capitalist exploitation relation. The preferred treatment of this production would be to subtract it from total capitalist new value, though it can be considered as a part of the total new value created in the economy. However, the lack of the appropriate data in the sources employed converts the decomposition into the most adequate treatment of self-employed production. This same methodology has been employed by Duménil and Lévy (1999a: 12-3, 1999b: 58, 2001: 23), Shaikh and Tonak (1994: 111-3; Appendix G, 304-22) and Mage (1963: 165).

corporate financial business (*CF*) and noncorporate business (*NC*). Figure 2 summarises the relation between the NIPAs sectors (in italic letters) and the levels of aggregation (in bold letters). Our *business* level of aggregation differs from the NIPAs *business* sector for two reasons. First, *government enterprises* and the residential rental income of *other private business* are excluded in our level of aggregation in relation to the NIPAs sector. The other reason is that the proprietors' income of this sector is divided between equivalent labor compensation and profits. These are also the reasons why the NIPAs *noncorporate business* sector does not correspond with our noncorporate business level of aggregation. Finally, *corporate* businesses, *corporate nonfinancial* businesses and *corporate financial* businesses are equivalent to their NIPAs counterparts.

Figure 3. Relation between NIPAs sectors and levels of aggregation



3.3 Imputations

The NIPAs use imputations to alter the standard accounting criteria for some specific economic processes. These imputations are seen as necessary to avoid anomalies and inconsistencies in the accounts. Robert Moulton, from the *Bureau of Economic Analysis*, has provided the following definition of imputation:

> 'An imputation in national accounts refers to a flow that must be estimated by the national accountant because there is no directly related monetary transaction that is recorded in the books of a party to the transaction. Imputations generally arise for one of two reasons: (a) own-account production that takes place within the production boundary of the system, such as services the produced by owner-occupied dwellings, or (b) transactions that are not directly associated with an exchange of money between the transacting parties because the transactions involve barter, transactions in kind, or bundling the provision of a service with a financial transaction, such as depositing funds in a bank' (Moulton, 2002: 3)

From our standpoint, imputations must be analyzed from a labor-theory-of-value perspective in order to discern their capitalist nature. If the imputation lacks of a

Marxian rationale, it must be canceled. The exclusion procedure implies to formulate a counterfactual set of accounts to postulate how accounts would be in the absence of the imputation. The NIPAs distinguishes eight groups of imputations, three of which do not correspond to the *business* sector. "Owner-occupied housing" and "Rental value of nonresidential fixed assets owned and used by nonprofit institutions serving households" relate to the imputed rentals of residential and non-residential buildings owned by households and non-profits institutions, respectively, while the "Government investment-related imputations" comprises the public investment. The other five groups of imputations are analyzed below:

"Services furnished without payment by financial intermediaries except life insurance carriers"

The idea behind this imputation is that some bank services related to deposits (credits) are not an explicitly priced but instead the bank pays (charges) interest rates lower (higher) than the reference rate. Thus, the NIPAs impute an interest income to depositors, who in turn spend it to buy the banking services, and a negative interest income to borrowers, that is instead treated as a purchase for banking services.[8] These purchases of services can count as intermediate output or final demand, depending on the customer sector.[9] In this manner, 'the gross output of banks consists of explicit sales of services, which are booked as fee income, and implicit sales of services, which are currently measured by banks' net interest income.' (Fixler et al., 2003: 36) Therefore, this imputation implies that all bank activity is productive of value. Although this is not in accord with the labor theory of value, the practical criterion presented in section 3.1 goes along with this imputation. Under this criterion, the imputation does not alter the new value created and, as a consequence, no counterfactual modification is required.

"Premium supplements for property and casualty insurance"

The rationale for this imputation is similar to the previous one. Property and casualty insurance carriers earn interest income on the reserves held to pay claims.[10]

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[8] 'An imputation for implicit financial services produced by banks is included in the NIPAs. Depositors purchase these implicit services with imputed interest income that eliminates the gap between the total interest received by banks and the total interest paid by banks.' (Fixler et al., 2003: 33)

[9] 'Implicit services count as intermediate consumption when consumed by businesses, household owner-occupiers, or nonprofit institutions serving households.' (Fixler et al., 2003: 40)

[10] 'Net gains from the invested funds in reserves are used to supplement revenue from premiums to pay for claims or for reinsurance services; in other words, policyholders pay a smaller premium in order to compensate for the opportunity cost of their funds that are held by the insurer.' (Chen and Fixler, 2003: 10)

This income is imputed to be paid to policy holders, who pay it back to carriers as premium supplements.[11] As this carriers' activity is considered productive, the imputation do not change the new value of the financial sector and no counterfactual modification is required.

"Farm products consumed on farms"

This imputation, related to farm self-consumption, needs to be deducted from the *noncorporate business* sector value added and net operating surplus –proprietors' income–, as it can not be considered as capitalist production.[12]

"Employment-related imputations"

Most of this group of imputations corresponds to the "Employer contributions for health and life insurance".[13] This refers to monetary payments made by employers to the insurance corporation rather than to employees.[14] The imputation rationale consists in treating them as part of the value added (employee's compensation), instead of as an intermediate input,[15] and it is coherent with the labor theory of value.[16] The other imputations within this group –"Food furnished to employees, including military and domestic service", "Standard clothing issued to military personnel" and "Employees' lodging"– represent pay-in-kind of employers to employees. Therefore, it is not against the labor theory of value to consider them as part of the variable capital and value added, rather than intermediate consumption, as it would be under the counterfactual.

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[11] 'Premium supplements are the component of implicit services arising from the investment income earned from the investment in reserves.' (Chen and Fixler, 2003: 10)

[12] 'The imputed value of food and fuel produced and consumed on farms is included in farm proprietors' income so that that measure reflects the income from all of the production of noncorporate farms.' (BEA, 2008: XII-5).

[13] A similar imputation is made for the "Contributions for government social insurance for Federal Government employees for certain programs". We are not concerned with this imputation, as it is part of the government value added.

[14] 'This case actually violates the definition I proposed earlier, which said that imputations are not recorded in the books of any party to the transaction. The contribution generally is recorded in the books of the employer (albeit as a transaction with an insurance corporation), but not the employee.' (Moulton, 2002: 4*n*)

[15] 'Imputed compensation is mostly employer contributions for insurance; the table treats all contributions for health and life insurance as imputations because they are not monetary transactions for the employee. The contribution is assumed to be treated as intermediate consumption under the counterfactual.' (Moulton, 2002: 4)

[16] Here, it is implied an adherence to the definition of variable capital as the total amount of money advanced for the purchase of labor force, as opposed to the value of labor force approach, which measures variable capital as the exchange value of the use values effectively consumed by the working force. (Cámara. 2003: 166-71) Shaikh and Tonak (1994: section 5.9, appendix N) and Sharpe (1982: 395-402) defend the latter approach, while Moseley (1982: 231-3) and Guerrero (1989: 517-57) defend the methodology employed in this paper.

Moreover, it seems that most of these imputations correspond to the *government* and *household* sectors.

"Private investment-related imputations"

Within this group, two imputations are made for "Owner-occupied residential structures" and "Nonresidential fixed investment by nonprofit institutions serving households" in order to compute them as investment rather that personal consumption expenditure. These imputations do not modify the value added. Also, the NIPAs add "Margins on owner-built housing" to account for the net value generated by non-market production as if it were carried out by the capitalist sector. The margins are assigned to the construction industry within the *noncorporate business* sector,[17] so they must be deducted from the value added and the proprietors' income.

4. DETAILED CALCULATIONS

In this section, the detailed calculations carried out for the estimation of the labor-theory-of-value magnitudes are elaborated. First, we describe the estimation of the division of the income of self-employed persons between equivalent compensation of employees and profits. Then, the estimation procedures of the new value and its primary and secondary distribution are detailed. Finally, the calculation of the fixed capital is presented.

4.1 Self-employed persons

As argued above, the NIPAs do not provide direct information to measure the noncapitalist business level of aggregation. Instead, the productive activity of the *noncorporate business* sector mixes capitalist unincorporated enterprises with independent workers and family-owned businesses; the income of both of them is accounted entirely as proprietors' income. The data availability prevents us from estimating the proprietors' income that corresponds to noncapitalist activities. Instead, the proprietors' income of self-employed persons is divided into equivalent compensation of employees and profits. The method employed for this division combines two different approaches, given the data availability in the NIPAs. The first approach consists in assigning an average wage to the self-employed persons (*SE*). The difficulty here lies in estimating this wage, which is calculated as the average

[17] 'The imputed net margin on owner-built housing is included in proprietors' income, classified in the construction industry.' (BEA, 2008: XII-6).

compensation of employees of wage-workers in the private sector: the total compensation of employees in the private sector (CoE_{PS}) between the full-time and part-time employees of the private sector ($FTPTE_{PS}$). Therefore, the equivalent compensation of employees of self-employed persons (CoE^1_{SE}) is first obtained by:

$$CoE^1_{SE} = \frac{CoE_{PS}}{FTPTE_{PS}} SE \tag{1}$$

The second approach takes two steps. The first consists in identifying the proprietors' income of *sole proprietors and partnerships* that corresponds to the exploitation of wage labor (PI^C_{SPP}) and, therefore, to the compensation of employees in this sector (CoE_{SPP}). It is assumed that the distribution of the income in the capitalist fraction of *sole proprietors and partnerships* is the same as in the *corporate nonfinancial sector* (CoE_{CN} and P_{CN}, respectively):

$$PI^C_{SPP} = CoE_{SPP} \frac{P_{CN}}{CoE_{CN}} \tag{2a}$$

In a second step, the difference between the total proprietors' income of *sole proprietors and partnerships* (PI_{SPP}) and PI^C_{SPP}, which corresponds to the total income of self-employed persons, is used to calculate again the equivalent compensation of employees of self-employed persons (CoE^2_{SE}), employing again the income distribution in the *corporate nonfinancial sector*:

$$CoE^2_{SE} = \left(PI_{SPP} - PI^C_{SPP}\right) \frac{CoE_{CN} + P_{CN}}{CoE_{CN}} \tag{2b}$$

A comparison of the results of both approaches yields the following conclusions. First, the wage equivalent income of self-employed persons in the second approach is, on average, a 92.3% of the income in the first approach, backing the consistency of both approaches.[18] Second, the second approach wage equivalent fluctuates around the first one, reflecting a higher exposure of the self-employed to business cycles. Therefore, both approaches are helpful to estimate the level and the dynamics of the income of

[18] If we limit to the postwar period, 1946-2007, this percentage is 100.17%.

self-employed persons along the period. The final estimation of the equivalent compensation of employees of the self-employed persons (CoE_{SE}) is obtained as a weighted average of both approaches, giving an stronger weight to the second component:

$$CoE_{SE} = 0.25CoE^{1}_{SE} + 0.75CoE^{2}_{SE} \quad (3)$$

Lately, the profit equivalent income of the self-employed persons (P_{SE}) is calculated as the deduction from the proprietors' income of the *sole proprietors and partnerships subsector* (PI_{SPP}) of the exploitation share of this proprietors' income (PI^{C}_{SPP}) and the equivalent compensation of employees (CoE_{SE}):

$$P_{SE} = PI_{SPP} - PI^{C}_{SPP} - CoE_{SE} \quad (4)$$

4.2 New value and income distribution

The labor-theory-of-value category of new value (*NV*) has its counterpart in the net value added (*NVA*) of the NIPAs. However, there is not always a straight correspondence between the NIPAs and the labor theory of value magnitudes. Sometimes, the conversion needs the deduction of two different headings: the value added by noncapitalist sectors, and the noncapitalist imputations added by the NIPAs.

For businesses (NV_B), the starting point is the net value added of the NIPAs *Business* sector (NVA_{BS}); the net value added of *government enterprises* (NVA_{GE}), the tenant-occupied housing rental income of the *other private business* ($TOHRI_{OPB}$), and the noncapitalist imputations "Farm products consumed on farms" (*FPCF*) and "Margins on owner-built housing" (*MOBH*) are deducted:

$$NV_B = NVA_{BS} - NVA_{GE} - TOHRI_{OPB} - FCFP - MOBH \quad (5)$$

For corporate businesses, corporate nonfinancial businesses and corporate financial businesses, there is a straight correspondence with NIPAs categories. The new value of corporate businesses (NV_{CB}) and the new value of corporate nonfinancial businesses (NV_{CN}) match, respectively, the net value added of *corporate business* and *corporate financial business* sectors, NVA_{CB} and NVA_{CN}. NV_{CF} is calculated as their difference:

$$NV_{CF} = NV_{CB} - NV_{CN} \tag{6}$$

For noncorporate businesses (NV_{NC}), the starting point is net value added in the NIPAs *noncorporate business* sector, which is calculated as the deduction of the net value added of the *business sector* (NVA_{BS}) from the net value added of the *corporate business* sector (NVA_{CB}). Then, the following flows are deducted: the net value added by *government enterprises* (NVA_{GE}), the tenant-occupied housing rental income of the *other private business* ($TOHRI_{OPB}$), and the noncapitalist imputations of "Farm products consumed on farms" (*FPCF*) and "Margins on owner-built housing" (*MOBH*). Of course, the calculation is analogous to deducting the new value of corporate businesses (NV_{CB}) from the new value of businesses (NV_B):

$$NV_{NC} = \left(NVA_{BS} - NVA_{CB}\right) - NVA_{GE} - TOHRI_{OPB} - FCFP - MOBH = NV_B - NV_{CB} \tag{7}$$

Primary income distribution: Variable capital and surplus-value

New value is distributed between variable capital and surplus-value. Variable capital (*v*) is defined as the amount of money expended to hire labor, including contributions to social security paid by employers. (See footnote 16) Therefore, the category compensation of employees from the NIPAs matches with the definition of variable capital and scarce adjustments are needed.

Variable capital of noncorporate businesses is arrived at by deducting the compensation of employees of the *government enterprises* (CoE_{GE}) from the compensation of the *noncorporate business* sector (CoE_{NCS}) and adding the equivalent compensation of employees of the self-employed persons (CoE_{SE}):

$$v_{NC} = CoE_{NCS} - CoE_{GE} + CoE_{SE} \tag{8}$$

Variable capital of corporate businesses (v_{CB}) is equal to the compensation of employees of the *corporate business* sector (CoE_{CB}), variable capital of corporate financial businesses (v_{CN}) is equal to the compensation of employees of the *corporate nonfinancial business* sector (CoE_{CN}), and variable capital of corporate financial businesses (v_{CF}) is calculated as the difference:

$$v_{CF} = v_{CB} - v_{CN} \tag{9}$$

Finally, variable capital of businesses (v_B) is obtained by adding the variable capital of corporate businesses and the noncorporate businesses:

$$v_B = v_{CB} + v_{NC} \tag{10}$$

For all levels of aggregation, surplus-value (s) is obtained as a deduction of variable capital from new value:

$$s_i = NV_i - v_i, \quad i = B, CB, CN, CF, NC \tag{11}$$

Secondary income distribution: Forms of surplus-value

The secondary distribution refers to the specific forms taken by the surplus-value: surplus-value appropriated by the government under the form of taxes (*sTAX*), surplus-value used (or received) for net interest payments (*sINT*), surplus-value distributed as dividends (*sDIV*), and surplus-value retained by businesses (*sRE*). *sTAX* is calculated as the sum of taxes collected by U.S. government from business –indirect taxes (taxes on production and imports less subsidies) plus taxes on profits (corporate taxes)–[19] and business current transfer payments.[20] *sINT* refers to the interests paid less the interests received by businesses. *sDIV* is the amount of dividends paid by corporate businesses. Finally, *sRE* is calculated by deducting the previous forms of surplus value from the total amount, and relates mainly to undistributed profits of corporate businesses, and proprietors' and rental income of noncorporate businesses.[21]

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[19] Actually, the proprietors' and rental income of self-employed, partnerships and unincorporated business is also taxable, but the NIPAs do not provide the taxes charged to this income.

[20] We have classified business current transfer payments into the *sTAX* form of surplus-value for two reasons: 1) these payments go to the government to a great extent –over 60% in 2007 according to Table 7.7 from the NIPAs–, and 2) both taxes and business current transfer payments constitute surplus-value that cannot be accumulated by businesses. According to the NIPAs, these payments 'include fines and certain fees paid to government, the portion of insurance premiums that is not a payment for service (net of benefits received), charitable contributions to nonprofit organizations, and various other unrequited payments.' (McCulla and Mead, 2007: 12)

[21] *sRE* also includes the "statistical discrepancy" that the NIPAs perform between the product and the income side of the accounts, specifically, for the *noncorporate business* sector. This means that the product side is taken as the most reliable measure, given the following definition of the statistical discrepancy given by the NIPAs:

'*Statistical discrepancy*. Although the value of GDI should equal the value of GDP, in practice, the values of these measures often differ. This is because each is calculated using a different set of methodologies and data sources. The statistical discrepancy that appears on the left side of the account shows how much the two measures differ. BEA views GDP as a more reliable measure of output than GDI because it considers the source data underlying

For businesses, $sTAX_B$ is obtained as the sum of the taxes on production and imports less subsidies of the *business* sector –which is calculated as the taxes on production and imports less subsidies of the *private* sector (ToP_{PS}), less the taxes on production and imports of the *household* sector ($ToPI_H$), plus subsidies of households (S_H), less the taxes on production and imports less subsidies of the *nonprofit institutions* sector (ToP_{NP})–, the taxes on corporate income (CT_{CB}), and the business current transfer payments of the *business* sector –which is calculated as the difference between business current transfer payments of the *private* sector (BTP_{PS}) and of the *households and nonprofit institutions* sector (BTP_{HN})–:

$$sTAX_B = \left(ToP_{PS} - \left(ToPI_H - S_H\right) - ToP_{NP}\right) + CT_{CB} + \left(BTP_{PS} - BTP_{HN}\right) \qquad (12a)$$

$sINT_B$ is equivalent to the net interest and miscellaneous payments of the *business* sector, which is calculated as the net interest of the *private* sector (NI_{PS}) less the net interest of the *household* (NI_H) and *nonprofit institutions* sectors (NI_{NP}):

$$sINT_B = NI_{PS} - NI_H - NI_{NP} \qquad (12b)$$

$sDIV_B$ is equivalent to the net dividends distributed by the *corporate business* sector (DIV_{CB}) and, finally, sRE_B is obtained as a deduction:

$$sRE_B = s_B - sTAX_B - sINT_B - sDIV_B \qquad (12c)$$

For corporate businesses, $sTAX_{CB}$ is calculated as the sum of the taxes on production and imports less subsidies of the *corporate business* sector (ToP_{CB}), the taxes on corporate income (CT_{CB}), and the business current transfer payments of the *corporate business* sector (BTP_{CB}):

GDP to be more timely and accurate. For instance, most of the annual source data used for estimating GDP are based on complete enumerations, such as Federal Government budget data, or are regularly adjusted to such enumerations, such as the quinquennial economic and government censuses. GDP is also based largely on the detailed benchmark input-output accounts that are available every five years. For GDI, only the annual tabulations of employment tax returns and Federal Government budget data are based on complete enumerations, and only farm proprietors' income and state and local government budget data are adjusted to complete enumeration. Most of the remaining components of GDI are calculated using tabulations of samples of tax returns, which become available for a given year with a more considerable lag than much of the data that is used to estimate GDP.' (McCulla and Mead, 2007: 22-23)

$$sTAX_{CB} = ToP_{CB} + CT_{CB} + BTP_{CB} \tag{13a}$$

$sINT_{CB}$ is equivalent to the net interest of the *corporate business* sector (NI_{CB}), and $sDIV_{CB}$ is equivalent to $sDIV_B$, and, therefore, to the net dividends distributed by the *corporate business* sector (DIV_{CB}). Finally, sRE_{CB} is obtained as a deduction:

$$sRE_{CB} = s_{CB} - sTAX_{CB} - sINT_{CB} - sDIV_{CB} \tag{13b}$$

For corporate nonfinancial businesses, $sTAX_{CN}$ is calculated as the sum of the taxes on production and imports less subsidies of the *corporate nonfinancial business sector* (ToP_{CN}), the taxes on corporate income of the *corporate nonfinancial business* sector (CT_{CN}), and the business current transfer payments of the *corporate nonfinancial business* sector (BTP_{CN}):

$$sTAX_{CN} = ToP_{CN} + CT_{CN} + BTP_{CN} \tag{14a}$$

$sINT_{CN}$ is equivalent to the net interest of the *corporate nonfinancial business* sector (NI_{CN}), and $sDIV_{CN}$ is equivalent to the net dividends distributed by the *corporate nonfinancial business* sector (DIV_{CN}). Finally, sRE_{CN} is obtained as a deduction:

$$sRE_{CN} = s_{CN} - sTAX_{CN} - sINT_{CN} - sDIV_{CN} \tag{14b}$$

For corporate financial businesses, all the forms of surplus value are calculated as the difference between the corporate and the corporate nonfinancial level of aggregation:

$$\begin{aligned} sTAX_{CF} &= sTAX_{CB} - sTAX_{CN}, & sINT_{CF} &= sINT_{CB} - sINT_{CN} \\ sDIV_{CF} &= sDIV_{CB} - sDIV_{CN}, & sRE_{CF} &= sRE_{CB} - sRE_{CN} \end{aligned} \tag{15}$$

For noncorporate businesses, $sTAX_{NC}$ is obtained as the taxes on production and imports less subsidies of the *noncorporate business* sector– which is calculated as the taxes on production and imports less subsidies of the *private* sector (ToP_{PS}), less the taxes on production and imports of the *household* sector ($ToPI_H$), plus subsidies of households (S_H), less the taxes on production and imports less subsidies of the

nonprofit institutions sector (ToP_{NP}) and of the *corporate business* sector (ToP_{CB})–, plus the business current transfer payments of the *noncorporate business* sector –which is calculated as the difference between business current transfer payments of the *private* sector (BTP_{PS}) and of the *households and nonprofit institutions* sector (BTP_{HN}) and of the *corporate business* sector (BTP_{CB})–:

$$sTAX_{NC} = \left(ToP_{PS} - \left(ToPI_{H} - S_{H}\right) - ToP_{NP} - ToP_{CB}\right) + \left(BTP_{PS} - BTP_{HN} - BTP_{CB}\right) \quad (16a)$$

$sINT_{NC}$ is calculated as the sum of the net interest of *sole proprietors and partnerships* (NI_{SPP}) and *other private business* (NI_{OPB}):

$$sINT_{NC} = NI_{SPP} + NI_{OPB} \quad (16b)$$

*F*inally, sRE_{NC} is obtained as a deduction:

$$sRE_{NC} = s_{NC} - sTAX_{NC} - sINT_{NC} \quad (16c)$$

4.3 Capital

The NIPAs do not provide information at all about fixed capital assets, so the FAs data source must be employed exclusively. The fixed productive capital invested in production by our levels of aggregation –businesses (Kf_{B}), corporate businesses (Kf_{CB}), corporate nonfinancial businesses (Kf_{CN}), corporate financial businesses (Kf_{CF}) and noncorporate business (Kf_{NC})– are equivalent to the FAs current-cost net stock of nonresidential fixed assets of the *private* ($NRFA_{PS}$), *corporate business* ($NRFA_{CB}$), *corporate nonfinancial business* ($NRFA_{CN}$), *corporate financial business* ($NRFA_{CF}$), and *noncorporate business* ($NRFA_{NCS}$) sectors, respectively.

5. RESULTS

The calculation results of this paper are presented in a datasheet, which is available by request to the author (scamara@correo.azc.uam.mx), containing 8 different tables that comprise the period 1929-2007 and the 5 levels of aggregation:

- Table 1. New value (*NV*)
- Table 2. Variable capital (*v*)

- Table 3. Surplus value (*s*)
    - Table 3a. Retained earnings (*sRE*)
    - Table 3b. Dividends (*sDIV*)
    - Table 3c. Interests (*sINT*)
    - Table 3d. Taxes (*sTAX*)
- Table 4. Fixed capital (*Kf*)

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APPENDIX: NIPAs AND FAs SERIES EMPLOYED IN CALCULATIONS

Table 1. Series from the Nacional Income and Product Accounts (NIPAs)

Series	Description	Code	Table(s)
BTP_{CB}	Business current transfer payments of corporate business	W323RC1	1.14
BTP_{CN}	Business current transfer payments of corporate nonfinancial business	W327RC1	1.14
BTP_{HN}	Business current transfer payments of the household and nonprofit institutions sector	W536RC1	7.12
BTP_{PS}	Business current transfer payments of the private sector	B029RC1	1.7.5, 1.10, 1.12, 1,16, 7.7, 7.12
CoE_{CB}	Compensation of employees of corporate business	A442RC1	1.13, 1.14
CoE_{CN}	Compensation of employees of corporate nonfinancial business	A460RC1	1.14
CoE_{GE}	Compensation of employees of government enterprises	A1658C1	1.13
CoE_{NCS}	Compensation of employees of noncorporate business	W462RC1	1.13
CoE_{PS}	Compensation of employees of the private sector	A4003C0	6.2
CoE_{SPP}	Compensation of employees of sole proprietors and partnerships	A1642C1	1.13
CT_{CB}	Taxes on corporate profits of corporate business	A054RC1	1.10, 1.12, 1.14, 1.16
CT_{CN}	Taxes on corporate profits of corporate nonfinancial business	B465RC1	1.14
DIV_{CB}	Net dividends of corporate business	A449RC1	1.10, 1.14
DIV_{CN}	Net dividends of corporate nonfinancial business	B467RC1	1.14
$FPCF$	Farm products consumed on farms	A2051C1	7.12
$FTPTE_{PS}$	Full-time and part-time employees of private industries	A4203C0	6.4
$MOBH$	Margins on owner-built housing	B1173C1	7.12
NI_{CB}	Net interest of corporate business	A453RC1	1.13, 1.14
NI_{CN}	Net interest of corporate nonfinancial business	B471RC1	1.14
NI_{H}	Net interest of the household sector	A2015C1	1.13, 7.12
NI_{NP}	Net interest of the nonprofit institutions sector	B1131C1	1.13, 7.11
NI_{OPB}	Net interest of other private business	B1657C1	1.13, 7.11
NI_{PS}	Net interest of the private sector	W272RC1	1.10
NI_{SPP}	Net interest of sole proprietors and partnerships	B1649C1	1.13, 7.11
P_{CN}	Corporate profits with inventory valuation adjustment and capital consumption allowances adjustment of corporate nonfinancial business	A463RC1	1.14
NVA_{BS}	Net value added of the business sector	A363RC1	1.9.5
NVA_{CB}	Net value added of corporate business	A439RC1	1.14
NVA_{CN}	Net value added of corporate nonfinancial business	A457RC1	1.14
NVA_{GE}	Net value added of government enterprises	W474RC1	1.13
PI_{SPP}	Proprietors' income of sole proprietors and partnerships	A1645C1	1.13
SE	Self-employed	A4501C0	6.7
S_{H}	Subsidies of the household sector	B1154C1	7.12
$TOHRI_{OPB}$	Tenant-occupied housing rental income of persons of the other private business	W285RC1	7.9
ToP_{CB}	Taxes on production and imports less subsidies of corporate business	W321RC1	1.14
ToP_{CN}	Taxes on production and imports less subsidies of corporate nonfinancial business	W325RC1	1.14
ToP_{NP}	Taxes on production and imports less subsidies of the nonprofit institutions sector	B1320C1	1.13, 7.12
ToP_{PS}	Taxes on production and imports less subsidies of the private sector	W254RC1	1.7.5
$ToPI_{H}$	Taxes on production and imports of the household sector	A2016C1	7.12

Table 2. Series from the Fixed Assets (FAs)

Series	Description	Code	Table
$NRFA_{CB}$	Nonresidential fixed assets of corporate business	k1ntotl2es000	4.1
$NRFA_{CF}$	Nonresidential fixed assets of corporate financial business	k1nfito2es000	4.1
$NRFA_{CN}$	Nonresidential fixed assets of corporate nonfinancial business	k1nnofi2es000	4.1
$NRFA_{NCS}$	Nonresidential fixed assets of noncorporate business	k1ntotl3es000	4.1
$NRFA_{PS}$	Nonresidential fixed assets of the private sector	k1ntotl1es000	1.1, 4.1