

## Differences in Surplus-value Rates between Developed and Underdeveloped Countries

: An analysis based on differences  
in productivity and capital composition\*

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Previous findings by Martínez have raised an important question, which this work contributes to solve: if over time a positive correspondence between productivity and surplus-value rate can be observed ¿why then do underdeveloped countries show higher surplus-value rates than developed countries?

Based on econometric analysis, cluster analysis and fixed effect panel analysis evidence is supporting that groups of less productive countries have higher or at least not lower surplus-value rates than those corresponding to more productive groups of countries. Nevertheless, it is also shown that over time or within the groups there is a correlation between productivity and surplus-value rate.

A feasible explanation of such national differences of surplus-value rate is examined considering organic composition of capital. ¿How does importing means of production affect such a composition and hence surplus-value rate in underdeveloped countries? An account is examined based on value theory and such composition is estimated in the case that means of production are imported.

Keywords: Exploitation, value, surplus, productivity, organic composition of capital.

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## I. Introduction

Previous findings by Martínez and other authors have shown that surplus-value rate in underdeveloped is higher or at least similar to that in developed countries. The higher productivity in developed countries should produce a clearly superior surplus-value rate compared to underdeveloped countries: there should be a correspondence between productivity and surplus-value rate. That kind of correspondence exists over time or between productivity and surplus-value rate within blocks of developed and underdeveloped countries but not between blocks. This work is a contribution to the explanation of this inconsistency.

The second section of this work discusses why surplus-value rate should increase over time or be higher in developed countries than in underdeveloped countries. The third and fourth sections examine the empirical evidence of the differences in surplus-value rate between countries with different degrees of productivity. The fifth section presents the empirical evidence found to sustain the explanation of the higher surplus-value rate in underdeveloped countries: value composition of capital is much higher than price composition of capital. Because underdeveloped countries import a great share of their means of production a value should be imputed to them. So section 5 explains how and why such an imputation is calculated. Value composition measures the difficulty to accumulate and therefore labor force is harder to absorb in underdeveloped countries where a higher surplus-value

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rate is thus required and made possible. Finally in the last section conclusions are presented.

## 2. Surplus-value rate and productivity according to general law of capitalist accumulation

In his “General Law of Capitalist Accumulation” Marx stated that there is a trend towards increasing organic composition of capital and consequently a relative overpopulation follows. Capitalism produces massive quantities of available unemployed workers: an industrial reserve army (IRA) allowing for accumulation in the branches where an accelerated growth is possible without the restraint a shortage of labor force would impose. Furthermore IRA is crucial in limiting wages and regulating active labor force. If accumulation were to occur with a steady or decreasing organic composition, natural growth of labor force would limit capital growth because capitalists would have to accumulate adjusting capital increase to labor force growth. In short, “General Law of Capitalist Accumulation” (GLCA) states that a **capitalist** raise in productivity calls for an increased organic composition of capital.

An increase in organic composition will decrease the profit rate unless a raise in surplus-value rate results in compensating the effect. Then growth in organic composition turns into an obstruction to accumulation whilst increases in surplus-value rate encourage it. Debates on the behavior of profit rate have not yet been settled in Marxist theory and go beyond the aim of this work. Nonetheless it must be made clear that tendencies which work against the falling rate of profit belong to a more concrete level of analysis. For example the relationship between productivity in wage goods and changes in real wage remains within the behavior of surplus-value rate.

This interpretation of the GLCA explains Marxist assumption on surplus-value rate and productivity among different countries: capital accumulation entails a growth in productivity, organic composition and surplus-value rate. Capitalist development requires an increase in organic composition of capital which itself calls for a growth in surplus-value rate in order to balance its negative effect on profit rate. Therefore it is reasonable to expect a direct correspondence between surplus-value rate and productivity because it is perfectly possible to assume that more productive countries have a higher volume of means of production in value against living labor, and thus they require a higher surplus-value rate than the one prevailing in less productive countries with a lower organic composition. Consequently, according to our interpretation Marx' assumption is a necessary conclusion to the GLCA.

To say that in mathematical terms:

When there is no fixed capital, it can be proved that:

$$\theta_A > \theta_B \rightarrow s'_A > s'_B$$

Where  $\theta_i$  is VCC value composition of capital of country  $i$  defined as  $c/(p+v)$  and not as the usual way;  $s'_i$  is the rate of surplus value of country  $i$ .<sup>1)</sup>

Thus, a country with a higher VCC requires a higher rate of surplus value

1) In order to prove that

$$\theta_A > \theta_B \rightarrow s'_A > s'_B$$

it is necessary to rewrite the rate of profit as:

$$g = \frac{\sigma}{\theta + 1 - \sigma}$$

where  $\theta$  and  $s'$  are as defined in the text and  $\sigma = s/(s+v)$ ,  $s$  is the surplus value and  $v$  is the variable capital. Assuming equal profit rates between countries the following is obtained:

$$\sigma_A(\theta_B + 1) = \sigma_B(\theta_A + 1) \text{ from which follows.}$$

From this inequity it easily follows the inequity looked after since

to attain the same rate of profit than a country with a lower VCC.

We will now explain how in certain circumstances capitalist reality contradicts a direct correspondence between productivity and surplus-value rate, even though other circumstances do allow for that kind of behavior.

### 3. Previous findings on the relationship between surplus-value rate and productivity between different countries

#### 1) Background

##### *Mexico and the United States*

Martínez compared surplus-value rates between a developed country and an underdeveloped country. She used her own calculations of monetary surplus-value rate for non-agricultural economy in Mexico, as well as calculations made by Fred Mosely (1991) of the surplus-value rate in the United States' economy as a whole. She showed that surplus-value rate in the United States was lower than that of Mexico between 1960 and 1987, as shown in Figure 1. The ratio between both rates remained 2 to 1 until 1982. This ratio increased to 3 to 1 in the following years until 1987.

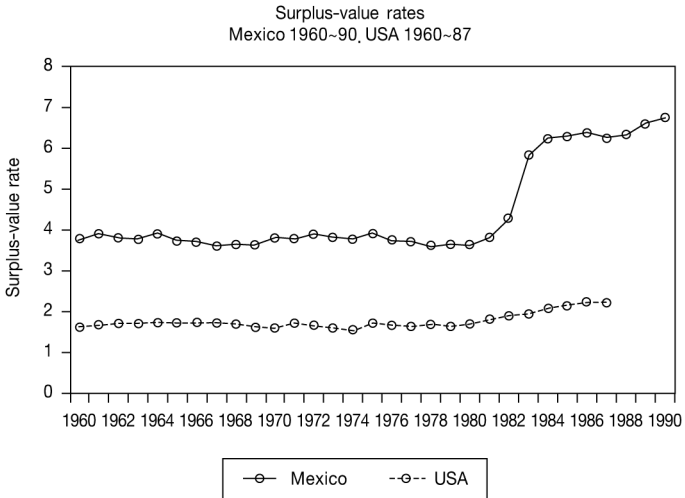
##### *Manufacturing*

Martínez (1999b) assessed surplus-value rates in the manufacturing industry in 20 countries throughout a year. Based on contingency tables, she sorted out two blocks of countries: one with high productivity and low surplus-value rate, and another one with low productivity and high surplus-value rate. She found that, between blocks the higher the productivity the lower

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$$\sigma_A > \sigma_B \rightarrow s'_A > s'_B$$

Figure 1.



Source: Own elaboration based on Gloria Martínez (1996 and 1999)

surplus-value rate, and within blocks, a higher productivity corresponded to a higher surplus-value rate. Accordingly, the results suggested that workers in underdeveloped countries were submitted to more exploitation than workers in developed countries. Based on square chi tests, which will be dealt with below, those results would later be reinforced.

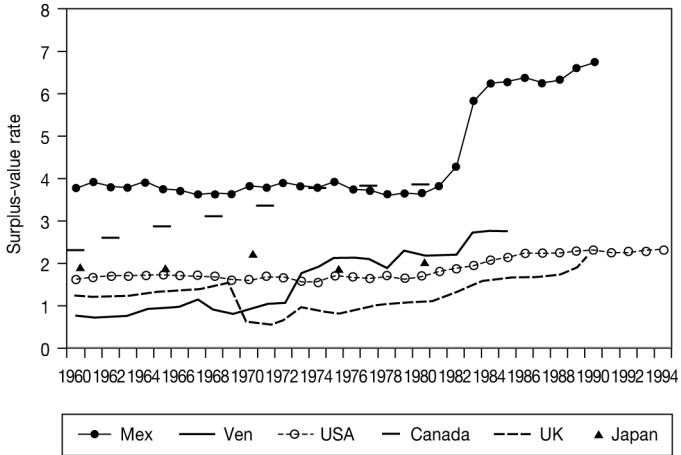
It must be stressed that these results do not fully contradict the validity of Marx' idea that the higher the productivity the higher the surplus-value rate; rather they partially confirm it because this relationship is found within blocks of countries.

### *Whole economies*

In the same work of Martínez (1999b) surplus-value rates of whole economies were assessed. Only five countries were studied for a period of several years, including just Mexico as an underdeveloped country. The results con-

Figure 2.

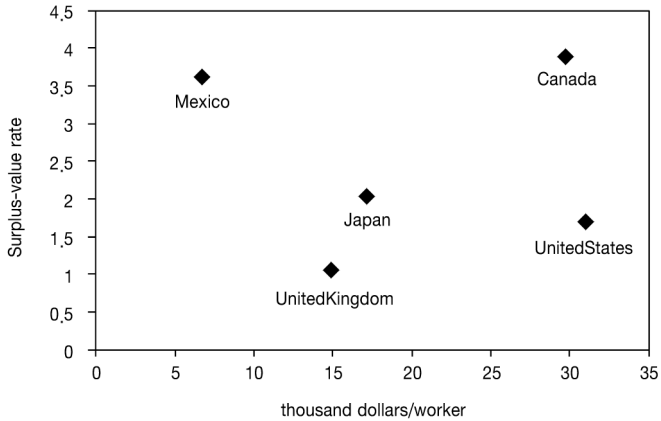
Surplus-value rates,  
Mexico and selected countries



Source: Taken from Gloria Martínez (199b:167)

Figure 3.

Relationship between productivity and  
monetary surplus-value rate, 1980



Source: Taken from Gloria Martínez (1999b:168)

firmed the findings attained in manufacturing: that Mexico, the under-developed country, was detached from developing countries as a country with low productivity and high surplus-value rate, and that among developed countries the most productive ones had higher surplus-value rates than less productive countries. This can be observed in figures 2 and 3.

## 2) Statistical tests

### *Square chi tests from the relationship between wage share and productivity*

As above mentioned, the inverse relationship between productivity and surplus-value rates in countries with very unequal productivity levels occurred in the economies of Mexico and the United States. From this evaluation an apparently useful idea came up: maybe wage share would allow for similar conclusions comparable to the ones drawn from surplus-value rate. Wage share could be a proxy variable of relative wage, which maintains an inverse correspondence with surplus-value rate. So Martínez (2006) decided to use wage share, a variable inversely related to surplus-value rate.

Because the analysis was redirected towards the relationship between wage share and productivity it was possible to include many more countries. With that approach observations increased dramatically since it was possible to use data collected by the United Nations from national accounts of 63 to 100 countries, depending on the year of the research. The relationship between productivity and wage share has been assessed, a relationship that was assumed to be positive between blocks of countries defined by productivity levels. That relationship is considered a sign showing that workers in under-developed countries endure more exploitation or that surplus-value rate is higher than in developed countries.

The results based on square chi tests show that statistically low productivity countries have low wage shares, while high productivity countries



Table 1. Contingency Table:  
 wage share and high or low productivity in 63 countries, 1994

	High productivity	Low productivity
Low wage share	8	23
High wage share	24	8

Source: Own elaboration based o Penn World Table Mark 5.1 y 6.1 and United Nations (1978 and 1999).

have high wage shares. These results are coincidental with the previous ones, which clearly show that the relationship between productivity and wage share between blocks of countries with low or high productivity is the opposite of what would be expected according to Marxist theory of accumulation. That is to say, assuming that wage share is an approximate variable of the reciprocal of surplus-value rate, this turns out to be higher in countries with low productivity and low wage share, as compared to that of countries with high productivity and high wage share. These results are shown in Table 1.

Furthermore, based on three productivity levels, the following differences in wage share between countries have been found: (1) countries with high productivity and high wage shares; (2) countries with low productivity and low wage shares; and (3) countries with medium productivity equally distributed between countries with high or low wage shares.

#### *Cluster analysis of the relationship between wage share and productivity*

The grouping of countries given by the cluster analysis matches the one based on purely economic criteria used in square chi analysis, especially with regard to developed countries. So results of the cluster analysis are consistent with the previous: assuming that wage share is an approximate varia-

ble of the reciprocal of surplus-value rate, wage share is lower (or the reciprocal of wage share, surplus-value rate, is higher) in countries with low productivity than in countries with high productivity.

According to the analysis of the 1994 data, there are three clusters, the first two correspond almost totally to both groups: countries with high productivity and high wage share, and countries with low productivity and low wage share. The third cluster includes countries that combine high or low productivity with high or low wage share. (The dendrogram and the corresponding lists of countries are shown in the appendix).

*A regression panel analysis with fixed effects of the relationship between surplus-value rate and productivity*

Surplus-value rates and productivities have been assessed directly. An econometric analysis was made based on estimates of surplus-value rate by different authors for the corresponding seven countries studied, and on estimates of purchasing power parity productivity taken from *Penn World Table Mark 6.1*. The technique of fixed effects panel for a sample of seven countries was used.

The analysis proves that there is a positive relationship between surplus-value rate and productivity **over time**. On the other hand, it supports previous findings by Martínez: what should be consistent with accumulation theory is not so. Surplus-value rate in underdeveloped and less productive countries (Mexico and Venezuela) is not lower than that in developed countries (United States, United Kingdom, New Zealand, and Japan) except for Canada and Japan with respect to Venezuela. This is shown in the corresponding section of Figure 5.

a) Including unadjusted surplus-value rate in Mexico

Based on this model a positive relationship can be found between surplus-value rate and productivity in all the assessed countries over time. Also, levels of surplus-value rate differ individually, in particular the one corresponding to Mexico with respect to that of the other countries. Assuming the same changes in surplus-value rate facing productivity changes in each country, surplus-value rate in Mexico turns out to be considerably higher than those of other countries. Therefore both assumptions are supported: the positive relationship between surplus-value rate and productivity according to Marxist accumulation theory, and our assumption that underdeveloped countries with low productivity have a high surplus-value rate in the group of countries formed by Mexico, the United States, Canada, United Kingdom, New Zealand, and Japan.

b) Including adjusted surplus-value rate in Mexico and Venezuela

According to Martínez (2005), in order to adjust operation surplus in Mexican national accounts through the exclusion of the income of self-employed workers, it has been considered convenient to deal with National Accounts by Institutional Sectors. It has been found that in a disaggregated level by economy sectors, there is not a perfect match with the National Accounts System, so the data from this system had to be adjusted according to the Institutional Accounts System.

Regarding Venezuela, the non-oil surplus-value rate was taken, and an adjustment was made similar to Mexico's, based on estimates by Juan Mateo (2003).

According to the results of this analysis, the existence of self-employed workers changes the level of surplus-value rate in Mexico. Nonetheless a previous conclusion still stands: Mexico, the underdeveloped country, is

Table 2. Regression panel analysis with fixed effects  $\alpha$  estimate.  
Period 1950-2000

	USA	Canada	UK	New Zealand	Japan	Mexico	Venezuela
$\alpha$	0.47	1.81	0.35	0.47	1.4	2.4	0.66
$\alpha_{Mex}/\alpha_i$	5.11	1.33	6.86	5.11	1.71	1	3.63

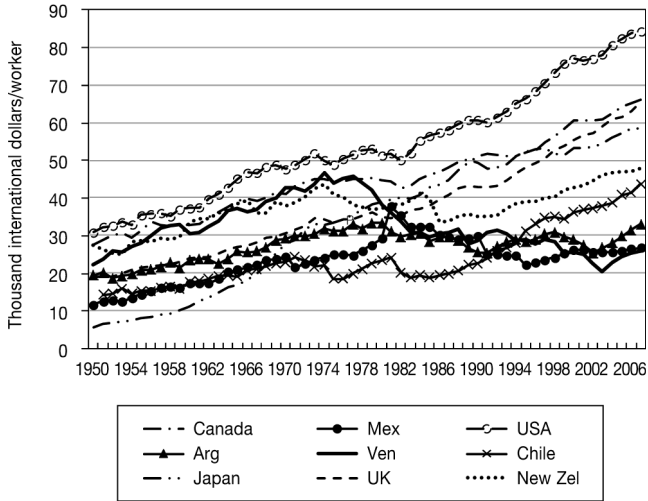
Source: Gloria Martínez (2006: table 2 in appendix 5)

more exploited than the United States, the developed country. The results based in the regression panel analysis with fixed effects confirm the positive relationship between surplus-value rate and productivity over time, in line with Marxist theory of accumulation; but they do not confirm the assumption inferred from the same theory according to which underdeveloped countries, less productive, have a lower surplus-value rate than developed countries, more developed; the results partially confirm our assumption that the underdeveloped countries, with low productivity, have a high surplus-value rate, proven by the case of Mexico, and only partially supported by the case of Venezuela, since it is confirmed with respect to the United States, the United Kingdom, and New Zealand, but not regarding Canada and Japan (see Table 2).

Martínez (2005) assesses some theoretical and empirical aspects of the problem of the income of self-employed workers in the estimates of surplus-value rates. The methodology in Shaikh and Tonak (1994) is examined, stating that such an approach is mistaken with regard to that income because it allocates it between variable capital and surplus in order to estimate surplus-value rate. Authors using that methodology handle independent work as exploited work, based on practical considerations and not on theoretical reasons. The present study shares the alternative approach: the one used by Guerrero (1989) and Cámara (2003), according to which independent work-

Figure 4.

Purchasing power parity productivity,  
Selected countries, 1950-2007



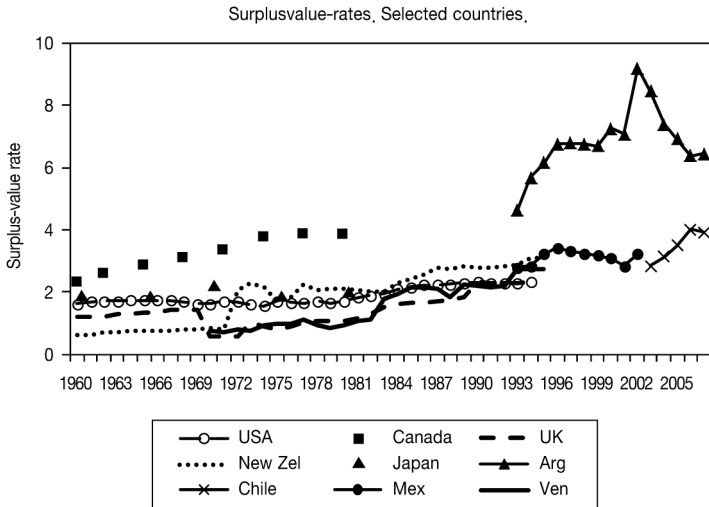
Source: own elaboration based on Penn World Table Mark 6.3

ers' income is neither variable capital, nor surplus value, so in order to estimate surplus-value rate it is necessary to leave that income out of the analysis.

The results seem to contradict Marx' faultless logic: higher productivity needs a higher organic composition and that requires a higher surplus-value rate. Why then are surplus-value rates empirically higher than those of countries with significantly higher productivity? This question came out much more firmly stated after the previously explained tests.

In what follows we will advance in verifying if previous results presented here are a norm and not an exception in contemporary capitalism, as well as in giving an answer to the above question in order to try to understand why capitalism works that way.

Figure 5.



Source: Own elaboration based on Martínez (2006: chap. V), Moseley (1991), Murray (1993), Cockshott (1995), Kalmans (1992), Cronin (1998), Mateo (2003), Bahena (2010) and Ocaña (2010).

#### 4. About new evidence: Argentina and Chile

It has been found that productivities in Argentina and in Chile correspond to the pattern of differences observed between Mexico, Venezuela, and developed countries (Martínez, 2006). Differences in productivity are clear between Latin American underdeveloped countries, and developed countries (discontinuous lines): the gap between both groups has become wider more notably in the 1980s, as shown in Figure 4.<sup>2)</sup>

On the other hand estimations of the rate of surplus-value by Bahena

2) We wish to thank Bernardo Bahena for his support in gathering and systematizing information on productivity for the analysis presented here.

(2010) and Ocaña (2010)<sup>3</sup>) in Argentina and Chile, respectively, support the findings by Martínez (1999, 2005, 2006) according to which, *surplus-value rate in underdeveloped countries is higher, than that of developed countries*, contrary to what might be assumed according to the theory. The reason of this will be advanced in the next section.

Such estimations of surplus-value rate in Argentina and Chile are analogous to those of Mexico as to non-productive labor and independent labor. That is, they are consistent with the adjusted surplus-value rate in Mexico. The results are shown in Figure 5.

## 5. An explanation based on differences in capital composition

### 1) Capital composition in underdeveloped countries

Valle (2008) gives empirical evidence of the size of the industrial reserve army and its growing pauperization in underdeveloped countries. Characteristic of this gap is that IRA is larger in underdeveloped countries. Theory of value is used as a basis to state that the value composition of capital is likely to be higher in an underdeveloped country than in a developed one; that it costs more to exploit a worker in the former than in the latter. *Importing a great percentage of its means of production and exporting products made in conditions of less productivity make means of production more expensive in labor in the underdeveloped country than in the developed one.* This means that in under-

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3) These investigations as well as that of Vicario (2010) referred to below, have been developed in the context of the project “Differences in surplus-value rates between countries and their relation to differences in productivity. New evidence: Brasil, Argentina, and Chile”, under the direction of B. Gloria Martínez González with the collaboration of Alejandro Valle Baeza.

developed countries capitalism faces greater difficulties to exploit all the available working force than in developed countries.

According to Valle (2008: 117), the relationship between market price and value is defined in equation 1

$$\lambda_i = \varepsilon_i \frac{P_i}{\mu} \quad (1)$$

where  $\lambda_i$  is the value of the commodity  $i$ ,  $\mu$  is the monetary expression of value, and  $\varepsilon_i$  is the divergence or error due to organic composition and to disparities between supply and demand. Following that definition, the price divided by the monetary expression of value gives the approximate value of a commodity. Estimating the value of a basket of commodities makes errors disappear to a certain degree.

So value composition of capital can be estimated based on price composition of capital divided by monetary expression of value.<sup>4)</sup>

The above is true for any commodity produced in a national economy. What happens on the international level? Perhaps a complete approach to this problem should be the subject of a book. Here only part of the problem will be approached i.e. what do disparities in productivity mean when a commodity is imported? An example with numbers can show the central ideas.

Consider two countries: An advanced one, A, and an underdeveloped one, B. Both produce grain with values of 1 and 2 labor units per grain unit, respectively ( $\lambda_{G,A}$  and  $\lambda_{G,B}$ ). Country A also produces fertilizers with a value of 3 labor units per each fertilizer unit  $\lambda_{F,A}$ . Grain prices in each country are 10 and 5 monetary units of each country per grain unit ( $p_{GA}$ ,  $p_{GB}$ ). The price of fertilizers in country A is 30  $p_{FA}$ . The exchange rate which equals grain

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4) A development on monetary expression of value, values, and prices is shown in Valle (1997).



Table 3.

Variable	A Country	B Country
$\lambda_G$	1	2
$\mu$	10	2.5
$p_g$	10	5
$p_f$	30	15
$\lambda_f$	3	6

prices is a monetary unit from B which amounts to two monetary units from A. This exchange rate illustrates a fact in international economy: national prices can not differ much from international prices. This exchange rate is the rate of purchasing power parity (PPP) because with it the monetary unit in each country can purchase the same amount of commodity in both countries.

With this exchange rate, monetary expression of value in country B is 5 monetary units from A. And as Marx clearly foresaw, this variable is the maximum wage in which profit would be zero. In our example, maximum wage in country B is half the one in country A, both of course in the same monetary unit: This shows that productivity in country B is half the one in A country.

If we estimate the value of the fertilizer with the monetary expression of B and the price of the imported fertilizer with PPP, we get an **imputed** value of the imported product, which is twice the value of the fertilizer in country A. That is, matching prices mean that the purchasing power of the residents in each country reflect the differences in productivity **even in imported goods**. Thus we can see why means of production must be more expensive in an underdeveloped country that imports them. The following table resumes the data and results from the example:

Generalization of the above for  $n$  commodities does not give further insight nor offers insurmountable difficulties so we put it aside. It is a very simple idea but it bears important implications to understand international economics. Let us now see how it works in the empirical domain.

## 2) A previous analysis of differences in composition of capital

In order to estimate value composition of capital (VCC) the definition of Valle (2008) is adopted and data in Penn World Table 5.6 are used: the real GDP per worker ( $rgdpw$ ) series as an estimation of the monetary expression of value and capital stock per worker ( $kpw$ ).

$$CVC_t = \left( \frac{kpw_t}{rgdpw_t} \right) \quad (2)$$

That is to say, in terms of theory of value we have a ratio total dead labor/living labor. (See Sources and method estimation of value composition of capital in Appendix)

In this work it was found that *value* compositions of capital and Bolivia in 1985 were notably higher in terms of prices; they were 91% and 140% of that of the United States, while, in terms of prices they barely represented 40% and 23% respectively, as shown in Table 4. Next section shows the results of a larger analysis.

Table 4. Gross calculation of VCC 1985 (selected countries)

Country	Year	Real gross domestic product per worker (1)	Capital per worker (2)	CVC=2/1	K/L to US ratio value	K/L to US ratio price
		International dollars per worker			%	%
U.S.A.	1985	33783	29925	0.88580055	100	100
Argentina	1985	14955	12084	0.80802407	91.2	40
Bolivia	1985	5623	6987	1.24257514	140.3	23

Source: Valle, 2008: 120.

### 3) An analysis of the differences in composition of capital between developed and underdeveloped countries

The results of the comparative analysis demonstrate the findings of Valle (2008) according to which the extent of the differences in compositions of capital between underdeveloped and developed countries decrease and are even reversed, when such compositions are considered in terms of value.<sup>5)</sup>

Figure 6 shows that price composition of capital (discontinuous lines) in Mexico, Argentina, and Chile represented between 30% and 40% of that of the United States from 1965 to 1992, while the one from Venezuela was between 70% and 80% of that of the US before the 1980s. In contrast, value compositions in the former represented between 70% and 90% of that of the US while in Venezuela it was up to 20% higher since the late seventies.

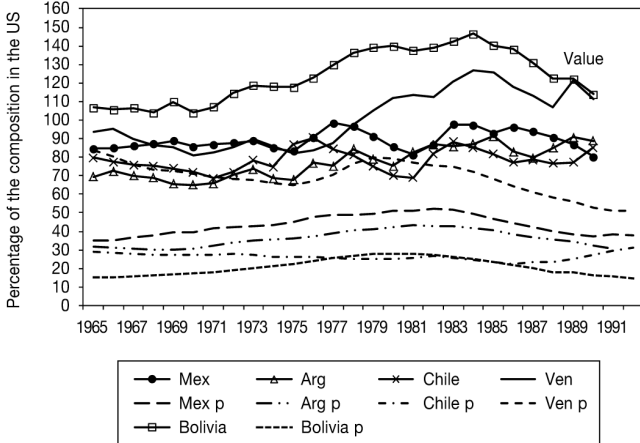
Even more relevant is that the pattern of the differences in the value composition of capital between these Latin American countries and the United

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5) We wish to thank Liliana Vicario Subdías for her support in gathering and systematizing information for the estimations of compositions of capital included here.

Figure 6.

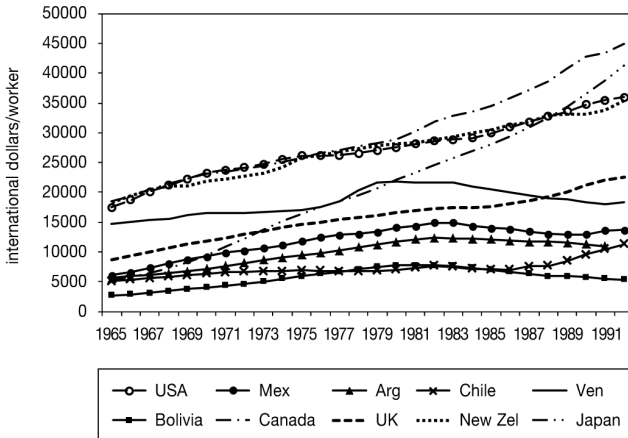
Relative value or price (p) compositions of capital  
Selected Latin American countries 1965-1990 (92)



Source: Own elaboration based on Penn World Table Mark 5.6.

Figure 7.

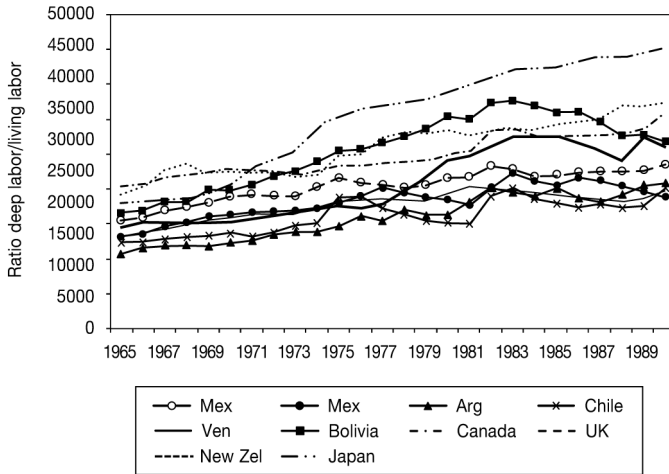
Price compositions of capital,  
Selected countries 1965-1992



Source: Own elaboration based on Penn World Table Mark 5.6.

Figure 8.

Value compositions of capital.  
Selected countries 1965-1990.



Source: Own elaboration based on Penn World Table Mark 5.6.

States is demonstrated in a larger sample of countries.

On the basis of the evidence examined so far, price composition of capital is lower in underdeveloped countries than in developed countries (discontinuous lines) with a growing gap, as shown in Figure 7. On the contrary, value compositions of capital in underdeveloped countries are notably similar to those of developed countries as shown in Figure 8.

## 6. Conclusions

This paper advances an explanation of why a reasonable expectation is not happening. Why is there no positive correspondence between productivity

and surplus-value rate between countries with considerable differences in productivity?

Summing up the basic idea is: between countries a higher productivity is obtained through a higher value of the means of production used. Accordingly, to maintain the rate of profit capital requires a higher surplus-value rate. So a higher productivity should correspond with a higher surplus-value rate.

As has been shown that does not occur: the blocks of less productive countries have a higher surplus-value rate or at least not lower than the more productive countries. However within blocks a correspondence does occur between productivity and surplus-value rate. Therefore between blocks of countries there is at least one variable working which does not work within blocks.

Underdeveloped countries do not manufacture an important part of the means of production they use. This paper has examined Valle's assumption (2008) according to which importing results in more expensive means of production in the underdeveloped country due to its lower medium productivity. A seemingly difficult aspect is approached within the theory of value: what is the imputed value of imported commodities? It is obviously an imputed value because they are imported commodities, why then are they not worth the same in the exporting and in the importing country? Theoretically, the reason is because international differences in productivity are not mirrored in the prices, which should be relatively homogeneous, but in the purchasing power of the populations. This is similar to what happens in a national economy: within branches firms producing with different productivities have similar or even the same prices, but their rates of profit increase with productivity.

Here it has been demonstrated that, in prices, developed countries have more capital per worker than underdeveloped countries; that explains their

higher productivity. At the same time, the value of capital per worker in developed countries is not as high or is even lower than the corresponding variable in underdeveloped countries. The value of the imported means of production is an imputed value expressing the real purchasing power of capitals in underdeveloped countries, which is the measure of the effort societies must undertake in order to accumulate. Using the terminology from Capital, we could say that technical composition of capital is lower in underdeveloped countries than in developed countries, but their relationship changes dramatically with value composition of capital.

There is an explanation to why surplus-value rate is higher or similar than in developed countries: the higher composition of capital requires a higher surplus-value rate, which is favored when the ability to absorb working force is weakened thus producing a larger IRA. The existence of a large industrial reserve army efficiently contributes to raise that rate.

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## □ Appendix

Square chi tests from the relationship between wage share and productivity, 1994.

### *Variables*

wslevel: wage share level

plevel: productivity level

### *Tabulated Statistics: wslevel, plevel*

Rows: wsnivel / Columns: pnivel

	phigh	plow	All
wshigh	24 16.25 1.92	8 15.75 -1.95	32 32.00 -
wslow	8 15.75 -1.95	23 15.25 1.98	31 31.00 -
All	32 32.00 -	31 31.00 -	63 63.00 -

### *Diagnostic*

Chi-Square = 15.246, DF = 1, P-Value = 0.000



## Cluster analysis' dendrogram and classified countries.

*Three clusters. Sample of countries in 1994.*

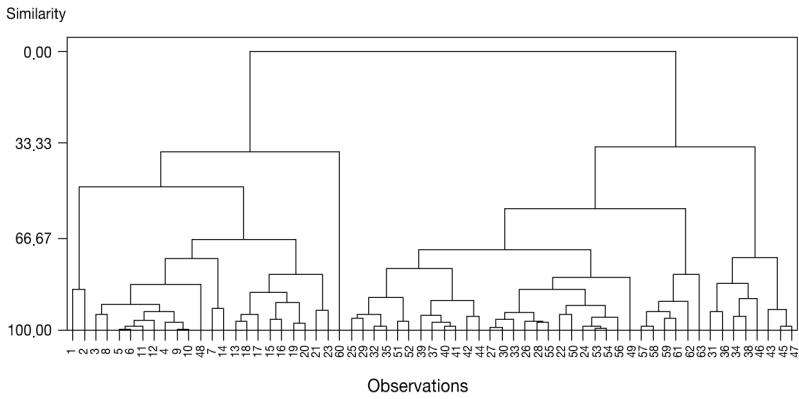


Table 1A. Numbers of countries classified according to productivity and wage share level.

	Countries with high productivity and high wage share, 1994.		Countries with low productivity and low wage share, 1994.
1	Luxembourg	25	Bostwana
2	The United States	26	Tunisia
3	Belgium	27	Panama
4	Norway	28	Jordan
5	Austria	29	Fiji
6	France	30	Namibia
7	Switzerland	31	Ecuador
8	Canada	32	El Salvador
9	Australia	33	Colombia
10	Ireland	34	Thailand
11	Denmark	35	Paraguay
12	Israel	36	Peru
13	United Kingdom	37	Romania
14	Sweden	38	Philippines
15	Iceland	39	Honduras
16	Spain	40	Bolivia
17	Finland	41	Papua New Guinea
18	Japan	42	Ivory Coast
19	Luxembourg	43	Sierra Leone
20	Portugal	44	Kenya
21	Islands Cayman	45	Nigeria
22	Trinidad and Tobago	46	Burundi
23	Sudan	47	Tanzania
24	Uruguay		
	Countries with high productivity and low wage share		Countries with low productivity and high wage share
48	Italy	56	Poland
49	Greece	57	Turkey
50	Mauritius	58	Costa Rica
51	Mexico	59	Bulgaria
52	Venezuela	60	Iran
53	New Zealand	61	Hungary
54	Slovenia	62	Sri Lanka
55	Russia	63	French Guinea

## Regression panel analysis with fixed effects of the relationship between surplus-value rate and productivity

Table 2A. Estimates and diagnostic.

Dependent variable: rate of surplus value

Method: GLS (Cross Section Weights)

Independent variable: productivity (P)

Sample: 1950 2000

Included observations: 51

Number of cross-sections used: 7

Total panel (balanced) observations: 182

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
P	0.032956	0.001490	22.11974	0.0000
Fixed Effects				
EU—C	0.475398			
CAN--C	1.813681			
RU—C	0.348390			
NZ—C	0.470685			
JAP--C	1.405849			
MEX--C	2.397509			
VEN--C	0.657718			
Weighted Statistics				
R-squared	0.909785	Mean dependent var.		2.343662
Adjusted R-squared	0.906155	S.D. dependent var.		1.544416
S.E. of regression	0.473117	Sum squared resid.		38.94815
Log likelihood	-70.32730	Durbin-Watson stat.		0.193128
Unweighted Statistics				
R-squared	0.556934	Mean dependent var.		1.699236
Adjusted R-squared	0.539110	S.D. dependent var.		0.778609
S.E. of regression	0.528589	Sum squared resid.		48.61676
Durbin-Watson stat	0.116717			

## Sources and method estimation of value composition of capital

The ratio capital work is generally considered at current prices or at prices of a basis year. When it is divided by the monetary expression of value, a gross estimation of the value composition of capital is obtained.

Price composition of capital: capital stock per worker ( $kpw$ ) is taken from Penn World Table Mark 5.2 (table 4) or 5.6 (figures 6-8).

Monetary expression of value: real gross domestic product per worker ( $rgdpw$ ) is taken from Penn World Table Mark 5.2 (table 4) or 5.6 (figures 6-8).

Value composition of capital ( $VCC_t$ ) is calculated according to the following equation:

$$VCC_t = \left( \frac{kpw_t}{rgdpw_t} \right)$$

where the subscript  $t$  stands for time.

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## □ 국문초록

### 선진국과 저개발국 사이의 잉여가치율 격차: 생산성 및 자본의 유기적 구성의 격차에 기초한 분석

글로리아 마르티네스 곤잘레스 · 알레한드로 바에 바에사

이 논문은 마르티네즈의 기존 연구가 제기한 중요한 문제를 해결하고자 한다. 즉 시간에 걸쳐 생산성과 잉여가치율 사이에 양의 상관관계가 존재한다면, 왜 저개발국들은 선진국에 비해 높은 잉여가치율을 나타내는가 하는 것이다.

계량경제학적 분석에 기초하여, 클러스터 분석 및 고정효과패널분석의 증거는 덜 생산적인 국가들의 그룹이 더욱 생산적인 국가들의 그룹에 비해 잉여가치율이 더 높거나 최소한 낮지는 않다는 사실을 보여준다. 그럼에도 불구하고, 또한 시간에 걸쳐서 또는 그룹 내부에서 생산성과 잉여가치율 사이에 상관관계가 존재함을 보여준다.

자본의 유기적 구성을 고려함으로써 그러한 국가적 잉여가치율의 차이에 관해 가능한 한 가지 설명을 검토한다. 수입된 생산수단이 그러한 구성, 따라서 저개발국가들에서의 잉여가치율에 어떠한 영향을 미치는가? 가치론에 입각한 설명이 검토되며, 생산수단이 수입되는 경우에 그러한 구성을 추정한다.

주요 용어: 착취, 가치, 잉여, 생산성, 자본의 유기적 구성.