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GENERAL CONDITIONS OF CRISIS

Stages of Accumulation of Capital and Reproduction

By Shizui KAMIMURA*†

Preface

The study made in this paper is concerned with what is stated by Karl Marx in his book "*Theorien über den Mehrwert*" as follows:

The general possibility of crisis is the formal metamorphosis of capital itself, the separation in time and space of purchase and sale. But this is never the cause of crisis. For it is nothing but the most general form of crisis, that is, crisis itself in its most generalised expression. It cannot however be said that the abstract form of crisis is the cause of crisis. If we seek its cause, what we want to know is why its abstract form, the form of its possibility, develops from possibility into actuality..... The general conditions of crisis, in so far as they are independent of price fluctuations (and whether these are linked with the credit system or not; price fluctuations as distinct from fluctuations of value), must be explicable from the general conditions of capitalist production" (K. Marx, *Theories of Surplus Value*, tr. by G.A. Bonner and E. Burns, Lond., Lawrence, 1951, pp. 389-390). As to this subject, there arises a question whether or not Marx's theory is 'Torso'. I should like to leave it to the interpretation of his logical statement itself.

0. Conditions and Laws of Production Cost Formation in Petty Commodity Production

Conditions (Equation)	Unknown	Known
(0.1) $1 = p_1 c_0 + a_0 k$	k	c_0, a_0
(0.2) $p_1 = p_1 c_1 + a_1 k$	p_1	c_1, a_1
(0.3) $p_2 = p_1 c_2 + a_2 k$	p_2	c_2, a_2
Total 3	3	6

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Laws (Answer)	(0.4) $k = \frac{1}{\frac{a_1 c_0}{1-c_1} + a_0}$
	(0.5) $p_1 = \frac{\frac{a_1}{1-c_1}}{\frac{a_1 c_0}{1-c_1} + a_0} = \frac{\frac{a_1 c_1}{1-c_1} + a_1}{\frac{a_1 c_0}{1-c_1} + a_0}$
	(0.6) $p_2 = \frac{\frac{a_1 c_2}{1-c_1} + a_2}{\frac{a_1 c_0}{1-c_1} + a_0}$

Symbols (* known number)

- 1 : Unit measurement of gold for money
- k : Income rate of independent petty commodity producer
- p_1 : Price of means of production
- p_2 : Price of consumer goods
- $*c_0$: Coefficient of means of production of gold for money
- $*c_1$: Coefficient of means of production of the means of production
- $*c_2$: Coefficient of means of production of consumer goods
- $*a_0$: Labour coefficient of gold for money
- $*a_1$: Labour coefficient of means of production
- $*a_2$: Labour coefficient of consumer goods

Explanation

(0.1), (0.2) and (0.3): "That price is determined by the reciprocal function of cost of production and competition... This was the first law the economist found, and purely empirical in its nature" (F. Engels, *Umrisse zu einer Kritik der Nationalökonomie*, 1844, in Marx Engels Werke, Bd. 1, Dietz Verl., 1957, S. 508). "It is the cost of production which must ultimately regulate the price of commodities, and not, as has been often said, the proportion between the supply and demand: The proportion between supply and demand may, indeed, for a time, affect the market value of a commodity, until it is supplied in greater or less abundance, according as the demand may have increased or diminished; but this effect will be only of temporary duration" (D. Ricardo, *The Principles of Political Economy and Taxation*, in the Works and Correspondence, ed. by P. Sraffa, Camb., 1953, Vol. 1, p. 382).

(0.4), (0.5) and (0.6): "In the early stages of society, the exchangeable value of these commodities, or the rule which determines how much of one shall be given in exchange for another, depends almost exclusively on the comparative quantity of labour expended on each" (Ricardo, *ibid.*, p. 12).

"Not only the labour applied immediately to commodities affect their value, but the labour also which is bestowed on the implements, tools, and buildings, with which such labour is assisted" (Ricardo, *ibid.*, p. 22). In

this case, "the labour directly consumed for the commodity" is represented by a_0 , a_1 , and a_2 whereas "the labour used for various tools etc. which aid the former" is represented by :

$$\begin{aligned}\frac{a_1 c_0}{1 - c_1} &= a_1 c_0 (1 + c_1^2 + c_1^3 + \dots) \\ &= a_1 c_0 + a_1 c_0 c_1 + a_1 c_0 c_1^2 + a_1 c_0 c_1^3 + \dots \\ \frac{a_1 c_1}{1 - c_1} &= a_1 c_1 (1 + c_1 + c_1^2 + c_1^3 + \dots) \\ &= a_1 c_1 + a_1 c_1^2 + a_1 c_1^3 + \dots \\ \frac{a_1 c_2}{1 - c_1} &= a_1 c_2 (1 + c_1 + c_1^2 + c_1^3 + \dots) \\ &= a_1 c_2 + c_1 c_2 c_1 + a_1 c_2 c_1^2 + a_1 c_2 c_1^3 + \dots\end{aligned}$$

The first item $a_1 c_0$ on the right of the first formula represents the labour consumed for the production of c_0 which is the means of production necessary for making one unit of gold for money. The third item $a_1 c_0 a_1^2$ represents the labour consumed for the production of $c_0 c_1 \times c_1 = c_0 c_1^2$ which is the means of production necessary for producing $c_1 c_0$, and so on. The total of these represents all the labour indirectly consumed for the production of one unit of gold for money. By the same token, the second formula and the third formula represent all the labour indirectly consumed for the production of one unit of means of production and consumer goods respectively.

Supplementary Explanation

The system of Adam Smith lacked, in fact, the condition of (0.1). Therefore, for him, the law of labour value had to take the following formula :

$$\begin{aligned}p_1 &= \frac{a_1}{1 - c_1} \cdot k = \left(\frac{a_1 c_1}{1 - c_1} + a_1 \right) k \\ p_2 &= \left(\frac{a_1 c_2}{1 - c_1} + a_2 \right) k\end{aligned}$$

In this connection, Ricardo declared in the opening chapter of his "*Principles*" that "the value of a commodity, or the quantity of any other commodity for which it will exchange, depends on the relative quantity of labour which is necessary for its production, and not on the greater or less compensation which is paid for that labour" (Ricardo, *ibid.*, p. 11).

Morris Dobb elaborated upon this and said, "only with the work of Adam Smith, and its more rigorous systematization by Ricardo, did Political Economy create that unifying quantitative principle which enabled it to make postulates in terms of the general equilibrium of the economic system". "It thus stressing the essential unity of economic events, Political Economy at the same time stressed the interdependence between the various elements

of which the system was composed....The form and magnitude of such related movements were given by the series of functional relations stated by the equations of which the classical theory of value in effect consisted" (M. Dobb, *Political Economy and Capitalism*, Lond., Routledge, 1950, pp. 5, 34).

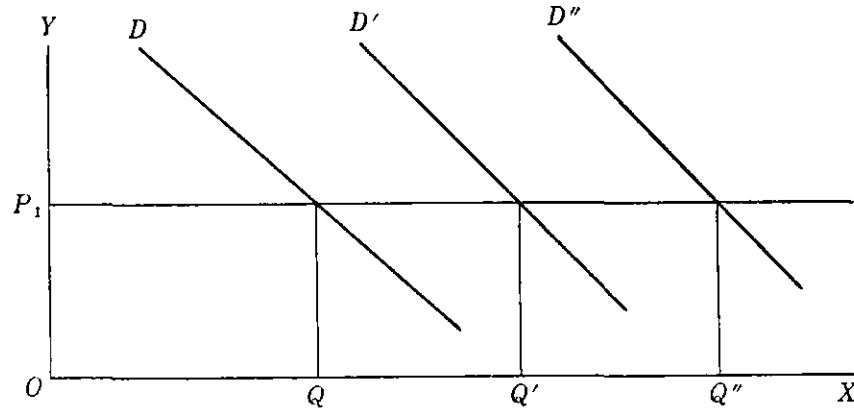


Figure 1. Demand-Supply and Production Cost

Regardless of the demand (D , D' and D''), the supply (Q , Q' , and Q'') satisfies respective demand without causing excess or shortage as long as the price (p_1) is identical to the production cost ($p_1c + a_1k$) by the movement of capital and labour. (Refer to Ricardo, *ibid.*, p. 382).

I. Conditions and Laws of Value Production

	Conditions (Equation)	Unknown	Known
Premises	(1.1) $k = \frac{1}{\frac{a_1c_0}{1-c_1} + a_0}$	k	c_0, a_0 c_1, a_1
	(1.2) $p_1 = \frac{\frac{a_1}{1-c_1}}{\frac{a_1c_0}{1-c_1} + a_0}$	p_1	
	(1.3) $p_2 = \frac{\frac{a_1c_1}{1-c_1} + a_2}{\frac{a_1c_0}{1-c_1} + a_0}$	p_2	c_2, a_2
Production	(1.4) $v_0 = \frac{a_1c_0}{1-c_1} + a_0$	v_0	
	(1.5) $v_1 = \frac{a_1}{1-c_1}$	v_1	
	(1.6) $v_2 = \frac{a_1c_2}{1-c_1} + a_2$	v_2	
Total	6	6	6

Laws (Answer)	(1.7) $k = \frac{1}{v_0}$
	(1.8) $p_1 = \frac{v_1}{v_0}$
	(1.9) $p_2 = \frac{v_2}{v_0}$
	(1.10) $v_0 = v_1 v_0 + a_0$
	(1.11) $v_1 = v_1 c_1 + a_1$
	(1.12) $v_2 = v_1 c_2 + a_2$

New symbols

v_0 : value of gold for money

v_1 : value of means of production

v_2 : value of consumer goods

Explanation

(1.1), (1.2) and (1.2): same as (0.4), (0.5) and (0.6) above.

(1.4), (1.5) and (1.6): "A use-value, or useful article, . . . , has value only because human labour in the abstract has been embodied or materialised in it". "We see . . . that that which determines the magnitude of the value of any article is the amount of labour socially necessary, or the labour-time socially necessary for its production" (K. Marx, *Capital*, Vol. 1, Moscow, Foreign Languages Pub. House, 1958, pp. 38-39).

(1.7), (1.8) and (1.9): "The common substance that manifests itself in the exchange-value of commodities, whenever they are exchanged, is their value" (Marx, *ibid.*, p. 38). "It is one of the chief failings of classical economy that it has never succeeded, . . . , in discovering that from under which value becomes exchange-value" (Marx, *ibid.*, pp. 80-81).

(1.10), (1.11) and (1.12): "The values of the means of production, . . . , are . . . constituent parts of the value . . . of the value of the production" (Marx, *ibid.*, p. 188).

Summary

"As exchange values, all commodities are but definite measures of congealed labor-time" (K. Marx, *A Contribution to the Critique of Political Economy*, tr. by N.I. Stone, Chic., Kerr, 1913, p. 24).

Supplementary Explanation

i): "The insufficiency of Ricardo's analysis of the magnitude of value, and his analysis is by far the best, will appear from the 3rd and 4th books of this work. As regards value in general, it is the weak point of the classical school of Political Economy that it nowhere, expressly and with full consciousness, distinguishes between labour, as it appears in the value of a product add the same labour, as it appears in the use-value of that

product....it has not the least idea, that when the difference between various kinds of labour is treated as purely quantitative, their qualitative unity or equality, and therefore their reduction to abstract human labour, is implied". "....it has never succeeded, by means of its analysis of commodities, and, in particular, of their value, in discovering that form under which value becomes exchange-value" (Marx, *Capital*, Vol. 1, pp. 80-81).

"The reason for this is not solely because their attention is entirely absorbed in the analysis of the magnitude of value. It lies deeper. The value-form of the product of labour is not only the most abstract, but is also the most universal form, taken by the product in bourgeois production, and thereby gives its special historical character" (Marx, *ibid.*, p. 81). Therefore, one should by no means consider the equations of (1.4), (1.5) and (1.6) as simply symbol substituted equations. They are the expressions that indicate the reduction of "tangible and useful labour" to "abstract-human labour". And this is the reason why (1.7), (1.8) and (1.9) indicate "the form under which value becomes exchange-value" (*Ibid.*).

ii): "The Marxian law of value holds generally, as far as economic laws are valid at all, for the whole period of simple commodity-production, that is, up to the time when the latter suffers a modification through the appearance of the capitalist form of production. Up to that time prices gravitate towards the values fixed—according to the Marxian law and oscillate around those values, so that the more fully simple commodity-production develops¹⁾, the more the average prices over long periods uninterrupted by external violent disturbances coincide with values within a negligible margin. Thus the Marxian law of value has general economic validity for a period lasting from the beginning of exchange, which transforms products into commodities, down to the 15th century of the present era. But the exchange of commodities dates from a time before all written history, which in Egypt goes back to at least 2,500 B.C., and perhaps 5,000 B.C., and in Babylon to 4,000 B.C., perhaps 6,000 B.C.; thus the law of value has prevailed during a period of from five to seven thousand years" (Marx, *ibid.* Vol. 3, 1959, p. 876, [Engel's Supplement]).

1) "Petty commodity production" means such fully developed "simple commodity production".

II. Conditions and Laws of Surplus Value Production

	Conditions (Equation)	Unknown	Known
Premises	(2.1) $k = \frac{1}{v_0}$	k	
	(2.2) $p_2 = \frac{v_2}{v_0}$	p_2	
	(2.3) $v_0 = v_1 c_0 + a_0$	v_0	c_0, a_0
	(2.4) $v_1 = v_1 c_1 + a_1$	v_1	c_1, a_1
	(2.5) $v_2 = v_1 c_2 + a_2$	v_2	c_2, a_2
Production	(2.6) $1 = p_2 w$	1	w
	(2.7) $m = \frac{k-1}{1}$	m	
Total	7	7	7
Laws (Answer)	(2.8) $1 = \frac{v_2 w}{v_0}$		
	(2.9) $m = \frac{1}{v_2 w} - 1$		
	or $1 = v_2 w (1 + m)$		

New Symbols (* is known figure)

1 : wage rate

m : surplus value rate

$*w$: daily standard amount of consumer goods necessary for the reproduction of labour (as to the actual measurement of this w , refer to *Capital*, Vol. 1, pp. 172-173).

Explanation

(2.1)–(2.5): The laws of value: refer to (1.7), (1.9), (1.10), (1.11) and (1.12) above.

(2.6): “The natural price of labour depends on the price of the food, necessaries, and conveniences required for the support of the labourer and his family. With a rise in the price of food and necessaries, the natural price of labour will rise; with the fall in their price, the natural price of labour will fall” (Ricardo, *op. cit.*, p. 93). “On the surface of bourgeois society the wage of the labourer appears as the price of labour, a certain quantity of money that is paid for a certain quality of labour. Thus people speak of the value of labour and call its expression in money its necessary or natural price. On the other hand they speak of the market-price of labour, i.e., prices oscillating above or below its natural price” (Marx, *Capital*, Vol. 1, p. 535).

(2.7.): “The rate of surplus value depends on . . . its [surplus value $(k-1)$]

proportion to the wages contained in the same commodity" (Marx, *ibid.*, Vol. 3, p. 303).

(2.8): Wages, that is the price of labour, is nothing but the monetary expression of the price of labour (Refer to *Capital*, Vol. 1, p. 539).

(2.9): "The labourer, during one portion of the labour-process, produces only the value of his labour-power, that is, the value of his means of subsistence. During the second period of the labour-process, that in which his labour is no longer necessary labour, the workman, it is true, labours, expends labour-power; but his labour, being no longer necessary labour, he creates no value for himself. He creates surplus-value which, for the capitalist, has all the charms of a creation out of nothing" (Marx, *ibid.*, Vol. 1, p. 217).

Summary

"It is every bit as important, for a correct understanding of surplus-value, to conceive it as a more congelation of surplus labour-time, as nothing but materialised surplus-labour, as it is, for a proper comprehension of value, to conceive it as a more congelation of so many hours of labour, as nothing but materialised labour" (Marx, *ibid.*, p. 217.)

III. Conditions and Laws of Surplus Values Production and Realization—Simple Reproduction—

	Conditions (Equation)	Unknown	Known
Premises	(3.1) $p_1 = \frac{v_1}{v_0}$	p_1	
	(3.2) $p_2 = \frac{v_2}{v_0}$	p_2	
	(3.3) $v_0 = v_1c_0 + a_0$	v_0	c_0, a_0
	(3.4) $v_1 = v_1c_1 + a_1$	v_1	c_1, a_1
	(3.5) $v_2 = v_1c_2 + a_2$	v_2	c_2, a_2
	(3.6) $1 = \frac{v_2w}{v_0}$	1	w
	(3.7) $1 = v_2w (1+m)$	m	
Production	(3.8) $K = (v_1c_1 + a_1v_2w)Q_1 + (v_1c_2 + a_2v_2w)Q_2$	$Q_1 + Q_2$	K
	(3.9) $Az = a_1Q_1 + a_2Q_2$	A	z
Realization	(3.10) $Q_1 = c_1Q_1 + c_2Q_2$	Q_1	
Total	10	10	9
Laws (Answer)	(3.11) $K = \left(\frac{v_1c}{a} + v_2w \right) Az$		
	(3.12) $a_1Q_1 = v_1c_2Q_2$		
	(3.13) $a_1Q_1v_2w(1+m) = v_1c_2Q_2$		

New Symbols (* = known)

- A : labour population
- Q_1 : production amount of means of production
- Q_2 : production amount of consumer goods
- $*K$: total capital of society
- $*z$: average annual working day per worker
- $*c$: average coefficient of means of production of social total products
- $*a$: average labour coefficient of social total products

Explanation

(3.1)—(3.5): Laws of value: refer to (1.8), (1.9), (1.10), (1.11) and (1.12) above.

(3.1) and (3.2) show that the commodity is exchanged according to its value. It should be noted, however, that for such purpose the conditions of (3.8), (3.9) and (3.10) below, in other words, the condition of concordance among the actual capital, labour, and means of production, are still necessary, now that capitalist production has been started. In other words, here the laws of value take so-called "a more developed expression of the law of value in general" (Marx, *ibid.*, Vol. 3, p. 621).

(3.3), (3.4) and (3.5) represent that the commodity is produced according to its value, and this becomes an implicit premise in this case. This remains to be true hereafter until the appearance of the discrepancy among the enterprises as to the production conditions. Besides, I will not repeat these hereafter.

(3.6) and (3.7): Laws of surplus value: Refer to (2.8) and (2.9) above. In this case, (3.6) shows that the labour power is sold according to its value, and (3.7) represents that such labour power is produced according to its value. (3.6) now appears at this theoretical stage as what depends on the condition (3.9) below which shows the balance of supply and demand of labour power.

(3.8): The left side represents the social total capital and the right side represents "the general annual product, part of the total mass of objects of every kind, into which the total capital of society, had been converted in the course of the year, i.e., Produktionsfond" (Marx, *ibid.*, Vol. 1, p. 580). $Q_1 + Q_2$ shows 'the total yearly production' or 'the year to year total products' as the result of the said transformation.

(3.9): Social total labour days are divided into the production of means of production and that of consumer goods in accordance with the total yearly production.

(3.10): "No society can go on producing, in other words, no society can reproduce, unless it constantly reconverts a part of its products into means

of production, or elements of fresh products. All other circumstances remaining the same, the only mode by which it can reproduce its wealth, and maintain it at one level, is by replacing the means of production—i.e., the instruments of labour, the raw material, and the auxiliary substances consumed in the course of the year—by an equal quantity of the same kind of articles; these must be separated from the mass of the yearly products, and thrown afresh into the process of production. Hence, a definite portion of each year's product belongs to the domain of production. Destined for productive consumption from the very first, this portion exists, for the most part, in the shape of articles totally unfitted for individual consumption" (Marx, *ibid.*, p. 566).

"In so far as reproduction obtains on the same scale, every consumed element of constant capital must be replaced in kind by a new specimen of the same kind, if not in quantity and form, then at least in effectiveness [in natural]" (Marx, *ibid.*, Vol. 3, p. 827).

So far we have been explaining the conditions of simple reproduction. However, there is no other condition at all other than (3.10) that is "the necessary and sufficient condition for the smooth progress of simple reproduction". And, in this case the expression "in natura" is to be noted particularly, because, when you look it over, there is a great danger of falling into the trap of so-called "circulationism".

(3.11): "With a given degree of exploitation of labour-power, the mass of the surplus-value produces is determined by the number of workers simultaneously exploited; and this corresponds, although in varying proportions, with the magnitude of the capital" (Marx, *ibid.*, Vol. 1, p. 608). In this sense, the so-called Prokrustesbett is compared with the national income by Samuelson but it is rather social total labour power that should be compared to it. Besides, the following passage is interpreted very specially (for instance, K. Uno, *Crisis*, 1953, pp. 210, 216), but it should be regarded as a popular expression of the above situation. Such passage is: "given the necessary means of production, i.e., a sufficient accumulation of capital, the creation of surplus-value is only limited by the labouring population if the rate of surplus-value, i.e., the intensity of exploitation, is given; and no other limit but the intensity of exploitation if the labouring population is given" (Marx, *Capital*, Vol. 3, p. 238).

The following are the formulae to introduce this law formula: Suppose:

$$\frac{c_1 Q_1 + c_2 Q_2}{Q_1 + Q_2} = c$$

$$\frac{a_1 Q_1 + a_2 Q_2}{Q_1 + Q_2} = a$$

Corresponding to the above, change the formulae of (3.4) and (3.5) into:

$$v_1 = v_2 = v_1c + a$$

When this is applied to the formulae (3.8) and (3.9), the formula (3.11) is obtained. The same procedure will be followed hereafter to introduce the law formula, but we will not repeat the explanation again.

Besides, in this case, v_1c/a or c/a corresponds to "the composition of the total social capital of a country", when it is said that "the many individual capitals invested in a particular branch of production have, one with another, more or less different compositions. The average of their individual compositions gives us the composition of the total capital in this branch of production. Lastly, the average of these averages, in all branches of production, gives us the composition of the total social capital of a country, and with this alone are we, in the last resort, concerned in the following investigation [accumulation of capital]" (Marx, *ibid.*, Vol. 1, pp. 612-613).

(3.12): "The portion of the constant capital ($v_1c_2Q_2$) which is consumed in the production of means of subsistence is replaced by constant capital (a_1Q_1) which during the year is produced by new labour" (Marx, *Theories of Surplus Value*, p. 350). This formula can be obtained by applying the formula (3.4) to (3.10). Besides, basically speaking, "Adam Smith's Dogma" comes from his lack of understanding of this point (Marx, *Capital*, Vol. 2, p. 370, etc.).

(3.13): However, "if production be capitalistic in form, so, too, will be reproduction" (Marx, *ibid.*, Vol. 1, p. 566). Thus, by applying (3.7) to the formula (3.12) above, (3.13) is obtained. In other words, "it follows that, on the basis of simple reproduction must be $I(V+M)=II C$ " (Marx, *ibid.*, Vol. 2, p. 402). Besides, those who understand this (3.13) as a "condition for simple reproduction to progress smoothly" (N. Bucharin, *Der Imperialismus und die Akkumulation des Kapitals*, 1926, S. 8), "decisive condition for simple reproduction" (M. Yamada, *Preface for Analysis of Reproduction Table and Formula*, 1931, p. 299), "the condition laid down for equilibrium in the case of 'simple reproduction'" (M. Dobb, *op. cit.*, p. 100), "basic condition of simple reproduction" (P.M. Sweezy, *The Theory of Capitalist Development*, Lond., 1952, p. 77) etc. are those who confuse the 'condition' for the realization of surplus value in the simple reproduction (3.10), and its law (3.13). In this respect, there is a criticism of the above, such as, "the condition for the social reproduction should be nothing but how the reproduction and circulation of this social total capital are done. In other words, the condition of reproduction and circulation of the social total capital (3.10) means its law (3.13)" (F. Yamamoto, *Study of Crisis Theory*, 1950, p. 93), but this should be deemed insufficient.

Summary

"We shall assume that capital circulated in its normal way" (Marx, *Capital*, Vol. 1, p. 564). In such case, "the product of the labourer is incessantly converted, into capital, into value that sucks up the value-creating power, into means of subsistence that buy the person of the labourer, into means of production that command the producers. The labourer therefore constantly produces material, objective wealth, but in the form of capital, of an alien power that dominates and exploits him; and the capitalist as constantly produces labour-power, but in the form of a subjective source of wealth, separated from the objects in and by which it can alone be realised; in short he produces the labourer, but as a wage-labourer. This incessant reproduction, this perpetuation of the labourer, is the sine qua non of capitalist production" (Marx, *ibid.*, p. 571). In other words, (3.11) has (3.12) and (3.13) as premises.

Figurative Explanation

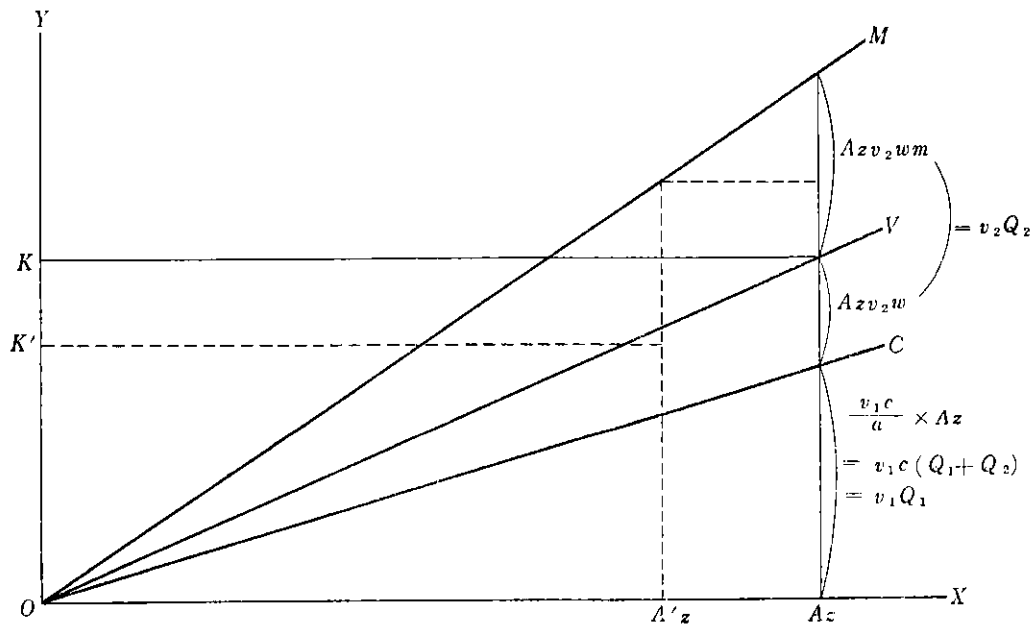


Figure 2. Creation of Workers Population by the Social Total Capital, and Production and Realization of Surplus Value

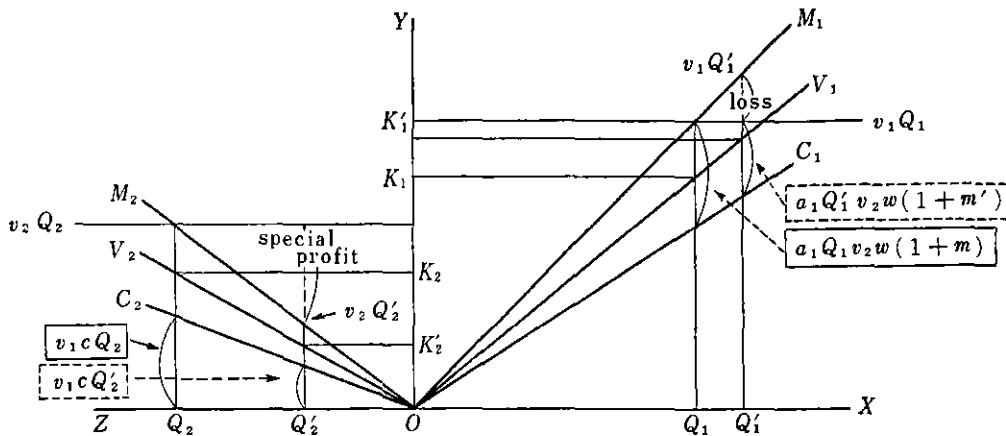
The social total capital (K), by investing the means of production of v_1c/a and the consumer goods of v_2w per one working day as "the actual capital", employs the workers population (A) and produces the surplus value of Azv_2wm at the production scale of $(v_1ca + v_2w)Az$. The surplus value thus produced is realized in the consumer goods market as $Azv_2w(1+m) = v_2Q_2$. At the same time, at the means of production market, the invested constant

capital is realized as $\frac{v_1 c}{a} \times Az = v_1 c (Q_1 + Q_2) = v_1 Q_1$. Thus the supplement of means of production and the subsistence maintenance of labour power, in other words, the reproduction of capital, are done.

Now, in this case, the following should not be forgotten: When the working population is given only as A' and therefore there is a shortage of working population $A-A'$ for the social total capital, and consequently the production of the surplus value is reduced. Accordingly, the labour to fill such shortage is created by way of changing violently or economically the production population of the non-capitalistic area into wage workers. The social total labour should be in this sense compared to the so-called "Prokrustesbett". It is explained in more detail as follows:

"The process,, that clears the way for the capitalist system, can be none other than the process which takes away from the labourer the possession of his means of production; a process that transforms, on the one hand, the social means of subsistence and of production into capital, on the other, the immediate producers into wage-labourers. The so-called primitive accumulation, therefore, is nothing else than the historical process of divorcing the producer from the means of production. It appears as primitive, because it forms the pre-historic stage of capital and of the mode of production corresponding with it" (Marx, *ibid.*, pp. 714-715).

"In the history of primitive accumulation, all revolutions are epoch-making that act as levers for the capitalist class in course of formation; but, above all, those moments when great masses of men are suddenly and forcibly form from their means of subsistence, and hurled are free and "unattached" [vogelfrei] proletarians on the labour-market. The expropriation of the agricultural producer, of the peasant, from the soil, is the basis of the whole process. The history of this expropriation, in different countries, assumes different aspects, and runs through its various phases in different orders of succession, and at different periods" (Marx, *ibid.*, p. 716). "It is this same severance of the condition of production, on the one hand, from the producers, on the other, that forms the conception of capital. It begins with primitive accumulation, appears as a permanent process in the accumulation and concentration of capital, and expresses itself finally as centralization of existing capitals in a few hands and a deprivation of many of their capital (to which expropriation is now changed)" (Marx, *ibid.*, Vol. 3, p. 241). And we see actually in front of us in Japan today the fact that these processes are steadily going on under the name of strong or high growth in the form of "integration", "shift to dairy farmer", "culturization" etc. "But what avails lamentation in the face of historical neces-



sity?" (Marx, *ibid.*, Vol. 1, p. 595).

In the production department of means of production (right side of the Figure), by the investment of capital K_1 , the means of production of Q_1 as well as the total value of $v_1Q_1(=C_1+V_1+M_1)$ and the surplus value of $a_1Q_1v_2wm(=M_1)$ are produced and are realized at the price of $v_1Q_1/v_0=p_1Q_1$. Similarly, in the production department of consumer goods, by the investment of K_2 which constitutes another part of the given social total capital, the consumer goods of Q_2 as well as the total value of $v_2Q_2v_2wm(=M_2)$ are produced and realized at the price of $v_2Q_2/v_0=p_2Q_2$. In this case, the transaction between the two departments is achieved on the equilibrium between $a_1Q_1v_2w(1+m)$ on the right and v_1cQ_2 on the left, surrounded respectively by the lines and indicated by the arrow.

Now, let us suppose that the investment in the production department of means of production is increased from K_1 to K_1' and proportionately the investment in the production department of consumer goods is reduced from K_2 to K_2' . ($K_1' + K_2' = K$ constant). In the production department of means of production the production of means of production increases from Q_1 to Q_1' and at the same time, the production of the total value increases from $v_1 Q_1$ to $v_1 Q_1'$. The production of surplus value was also increased from $a_1 Q_1 v_2 w m$ to $a_1 Q_1' v_2 w m$. However, since the amount of realization which the realization formula requires is only $v_1 Q_1$, the value of $v_1 Q_1' - v_1 Q_1$ is not realized and the means of production $Q_1' - Q_1$ are represented as surplus production. In other words, in the production department of means of production, the surplus value shown by dotted line on the Figure is not realized, but the loss of that size actually takes place.

On the other hand, in the production department of the consumer goods, by the decrease of invested capital from K_2 to K_2' , the production of

consumer goods is reduced from Q_2 to Q_2' and at the same time the production of total value and that of surplus value are reduced from v_2Q_2 to v_2Q_2' , and from $a_2Q_2v_2wm$ to $a_2Q_2'v_2wm$ respectively. However, the realization amount which the realization law (3.13) requires is in this case v_2Q_2 and the value equivalent to $v_2Q_2 - v_2Q_2'$ is realized in excess and the special profit of the size surrounded by the dotted line on the Figure is produced. In this case, "the deal between the two departments" is done by $v_1c_2Q_2'$ on the left side which corresponds to $a_1Q_1'v_2w(1=m')$ (m' = realized surplus value ratio) on the right side shown by the arrow and surrounded by the dotted line on the left Figure. When the employment in the production department of means of production increases and the use of means of production in the consumer goods production department decreases, the former becomes larger than the latter, i.e. $a_1Q_1'v_2w(1+m') > v_1c_2Q_2'$. This is represented as shortage of consumer goods and surplus of means of production. Now, the reverse progress takes place as to the transfer of capital from the production department of means of production to the consumer goods department.

However, in this case, "the proportionate use of capitals in the various spheres is equalised by a continuous process, nevertheless the continuity of this process itself equally presupposes the constant disproportion, which it has continuously, often violently, to even out" (Marx, *Theories of Surplus Value*, p. 368). In the Figure, the excessive investment in the production department of means of production is shown to such degree that even if not all the surplus value be realized, at least a part of it is realized. However, when the excessiveness of investment is too big and the part where the value is not realized is extended to the capital value, then the transfer of the capital can be suspended, and therefore the crisis (violent realization of balance) can take place. But "Ricardo and others admit his form of crisis" (Marx, *ibid.*, p. 399) and nothing than that.

More in detail, it is possible here that "partical crisis" is changed into "general crisis" via conditions of money. In other words, it can be said that "for a crisis (and therefore also overproduction) to be general, it is sufficient for it to grip the principal articles of trade" (Marx, *ibid.*, p. 393). However, it is impossible that general crisis is created in itself by the actual conditions²⁾. The error of Ricardo is that he denied the

2) I stated in summary that "it is impossible that general crisis is created in itself by the actual conditions". It is necessary to make some explanation thereon. But the points are nothing but the following three.

(1) Balance of supply and demand of products in the capitalistic developing reproduction takes the form of so-called "insufficient employment balance" including unem-

possibility of change from "partial crisis" to "general crisis" via conditions of money, and at the same time, he generalized this and created the dogma that there can never be a general crisis. In fact, Ricardo only admitted "partial crisis" and denied "general crisis" and even its possibility. Ricardo said, "too much of a particular commodity may be produced, of which there may be such a glut in the market, as not to repay the capital expended on it; but this cannot be the case with respect to all commodities" (Ricardo, *op. cit.*, p. 292).

The criticism of Marx against this famous passage of Ricardo is very sharp. Marx said, "the necessity for the commodity to transform itself into money means only that the necessity exists for all commodities. And inasmuch as there is a difficulty in a single commodity making this metamorphosis, the difficulty can exist for all commodities. The general nature of the metamorphosis of commodity—which includes the separation of purchase and sale as well as their unity—instead of excluding the possibility of a general glut, is rather the possibility of a general glut" (Marx, *Theories of Surplus Value*, p. 392).

Supplementary Explanation

According to the recent general evaluation, Marx's simple reproduction theory is as follows. "The concept of the stationary state had been, as we know, quite familiar in the preceding period [prior to 1870]. But it was used to denote an actual state of the economy to be expected at some future time rather than as a methodological fiction" (J.A. Schumpeter, *History of Economic Analysis*, N.Y., 1955, pp. 965–966). (For instant, J.S. Mill spoke of "this impossibility of ultimately avoiding the stationary state—this irresistible necessity that the stream of human industry should finally spread itself out into an apparently stagnant sea" (J.S. Mill, *Principles of Political Economy*, 6. ed., Lond., 1865, Vol. 2, p. 326)). "In the latter capacity [namely "an economic process that goes on at even rates or, more precisely, an economic process that merely reproduces itself"] it has been used to the full only by Marx, who called it simple reproduction" (Schumpeter, *op. cit.*, pp. 964, 965–966). If I add one comment to the above scrupulous evalua-

employment in itself, while making technological progress its premise.

(2) Therefore, the social total yearly production is smaller as compared with the case of "full employment".

(3) When the investment exceeds the said equilibrium point of insufficient employment, then the total production exceeds the balanced production point, and there "general crisis" takes place inevitably. It is almost self-evident that in the case of simple reproduction with no technological change, such crisis, so-called "real crisis" cannot take place.

The above point will be taken up in detail in a separate article where I will discuss the so-called "accelerated accumulation" (beschleunigten Akkumulation).

tion, "device for simplification" or "tool of analysis" is no longer a simple device nor tool in Marx but an abstraction from actual and historical process from which all accidental elements have been cleaned out.

Now, it is true to our regret that Marx's simple reproduction theory as above has been used as simple "formula" because of the simplicity in form with which his theory is developed by formulas and tables, and that there is a tendency that the theoretical basis of his idea tends to be neglected. Therefore, it would not be useless to try here to give some explanation on this point³⁾.

Now, as widely known, Marx's "simple reproduction formula" is summarized in the following two arithmetical formulas (Marx, *Capital*, Vol. 2, p. 397).

$$\text{I) } 4000c + 1000v + 100m = 6000$$

$$\text{II) } 2000c + 500v + 500m = 3000$$

and another group of two arithmetical formulas (*Ibid.*)

$$\text{I) } 4000c + 1000v = 5000$$

$$\text{II) } 2000c + 500v = 2500$$

and the following arithmetical formula (*Ibid.*, p. 398).

$$(1000v + 1000m) \text{ I} = 2000c \text{ II}$$

This last formula is drawn as conclusion and law. When we rewrite this into our algebraic formula, it is as follows:

$$v_1c_1Q_1 + a_1Q_1v_2w + a_1Q_1v_2wm = v_1Q_1 \quad (1)$$

$$v_1c_2Q_2 + a_2Q_2v_2w + a_2Q_2v_2wm = v_2Q_2 \quad (2)$$

$$v_1c_1Q_1 + a_1Q_1v_2w = K_1 \quad (3)$$

3) For your reference, the research on Marx's reproduction started in 1862 from the view-point of literature. "The simple reproduction formula" which is used today is taken from the last manuscript for Volume II of "*Capital*". (Manuskript VIII, written after July 2, 1878). The completion of the succeeding development of "enlarged reproduction formula" was entrusted to Engels through Marx's daughter Eleanor in 1883 a little before Marx's death. Engels, however, "I have construed this task in its narrowest meaning I have confined my work to the more selection of a text from the available variants" (Marx, *Capital*, Vol. 2, p. 5) as he mentioned himself. It is therefore the natural result that Marx's "Reproduction-Realization Theories" had to be finished in itself as torso. The theoretical development during that period will be analysed later in detail but in any case, when we consider the fact that such an unprecedented genius spent 20 years and yet could not complete it, we cannot treat the theme easily. Besides, it should be added here that Paul Samuelson, student of Schumpeter, delivered a speech at the time of his assuming to presidency of American Economic Association at its 74th Annual General Meeting in 1961 and said, "technical change was gold in giving Marx cyclical insights, and dirt in giving him secular insights or an understanding of evolving equilibrium states" (P.A. Samuelson, "Economists and the History of Ideas", *American Economic Review*, Vol. 52, No. 1, March 1962, p. 14).

$$v_1c_2Q_2 + a_2Q_2v_2w = K_2 \quad (4)$$

$$a_1Q_1v_2w + a_1Q_1v_2w = v_1c_2Q_2 \quad (5)$$

Now, let us examine these formulas, I recall now that some time ago, the assertion that Marx's reproduction system is formula was usually rewarded with contempt and sneer,

The formula (1) above shows the result of multiplying with Q_1 and Q_2 respectively the both sides of our formulas :

$$v_1 = v_1c_1 + a_1 \quad (3.4)$$

$$v_2 = v_1c_2 + a_2 \quad (3.5)$$

The formulas (3) and (4) show similarly the division of the first and second parts of our formula :

$$K = (v_1c_1 + a_1v_2w)Q_1 + (v_1c_2 + a_2v_2w)Q_2 \quad (3.8)$$

and their total corresponds to (3.8).

Lastly the formula (5) shows the result of applying our formulas (3.4) and (3.7) to our formula

$$Q_1 = c_1Q_1 + c_2Q_2 \quad (3.10)$$

Please refer to the previous explanation on (3.10). Besides, in this case, Marx, stated, "the figure may indicate millions of marks, francs, or pounds sterling" (Marx, *ibid.*, p. 397).

This means that in order to use price-wise expression, it is necessary to divide with v_0 (value of gold for money) both sides of his above formulas, and according to the unit of v_0 , his formulas can be made in marks, francs or pounds sterling according to your wish. Therefore, Marx's simple reproduction formulas include implicitly our formulas (3.1) (3.2) (3.3) and (3.6) besides those mentioned above. If so, in the organization III of our formulas, all the formulas except the following two :

$$Az = a_1Q_1 + a_2Q_2 \quad (3.9)$$

$$K = \left(\frac{v_1c}{a} + v_2w \right) Az \quad (3.11)$$

are included in Marx's "simple reproduction formulas". And (3.11) in the "law" derived from (3.9) and (3.10), two "conditions for surplus value production".

For Marx, it is not the production of surplus value but the realization thereof that concerns him in *Capital*, Vol. 2, Chap. 3, Sec. 20. Therefore the above should be taken for granted. But there may be an argument that if so, the formulas

$$\text{I) } 4000c + 1000v = 5000$$

$$\text{II) } 2000c + 500v = 2500$$

which constitute one of the conditions of "surplus value production", or the formula

$$K = (v_1c + a_1v_2w)Q_1 + (v_1c_2 + a_2v_2w)Q_2 \quad (3.8)$$

would not be necessary. However, when these formulas are not existent, the actual "total production" $Q_1 + Q_2$ becomes indefinite as shown by the organization III of formulas, and the "simple reproduction formula" cannot be effective. Therefore, Marx explicitly showed here this (3.8) formula which seems to be unnecessary at the first sight and which is "the condition of surplus value production".

On the other hand, the formula

$$Az = a_1Q_1 + a_2Q_2 \quad (3.9)$$

is just to decide the social total working days as unknown figure and therefore there is no worry about the total production which can never be indefinite even without this condition. So far as this formula is concerned, as Marx put it himself, "the only act within the sphere of circulation on which we have dwelt was the purchase and sale of labour-power as the fundamental condition of capitalist production" (Marx, *ibid.*, p. 353), it is itself useless here. But the medal has a reverse side. In the enlarged reproduction formula which is developed below, the social total working days themselves have become themselves a known figure and serve as a "key" to determine the total production. It is necessary and essential to treat it explicitly. And it was in fact the direct reason of error and confusion of Marx's "enlarged reproduction formula" that he overlooked this point. I will discuss this in detail in my separate article.

Now, as explained above, Marx's "simple reproduction formula as itself lacks only formula (3.9) which is not necessary for the presentation of conditions for the realization of surplus value and the deduction of its law, the figures represented there all consist of the numbers which must be theoretically derived through the given formula organization by giving to all known figures certain numbers. It is never "a mathematical manipulation with cleverly chosen figures" as Rosa Luxemburg feared. (R. Luxemburg, *The Accumulation of Capital*, tr. by A. Schwarzschild, Lond., Routledge, 1951, p. 125).

The following is the representation of this situation to the necessary extent.

This paper intends to give Marxian theory of crisis an expression of modern economics. It remains incomplete and has not yet touched the core of the problem. But as the author died, we have decided to publish it in such incomplete form. — Editor's Note —

Analysis of Marx's "Simple Reproduction Formula"

	Conditions (Equation)	Unknown	Known
Premises	$(3.4) \quad v_1 = v_1 c_1 + a_1$ $(3.5) \quad v_2 = v_1 c_2 + a_2$ $\therefore v_1 = v_2 = v_1 c + a = \frac{a}{1-c} = \frac{\frac{1}{3}}{1 - \frac{2}{3}} = 1$ $(3.7) \quad 1 = v_2 w (1 + m)$ $\therefore w = \frac{1}{v_2 (1 + m)} = \frac{1}{2}$	v_1 v_2 w	$4) \quad c_1 = c_2 (=c) = \frac{2}{3}$ $a_1 = a_2 (=a) = \frac{1}{3}$ $5) \quad m = 1$
Production	$(3.8) \quad K_1 = (v_1 c_1 + a_1 v_2 w) Q_1$ $K_2 = (v_1 c_2 + a_2 v_2 w) Q_2$ $K = (v_1 c + a v_2 w) (Q_1 + Q_2)$ $7500 = (1 \times \frac{2}{3} + \frac{1}{3} \times 1 \times \frac{1}{2}) (Q_1 + Q_2)$ $\therefore Q_1 + Q_2 = 9000$	$Q_1 + Q_2$	$K = 7500$
Realization	$(3.10) \quad Q_1 = c_1 Q_1 + c_2 Q_2$ $= c (Q_1 + Q_2)$ $= \frac{2}{3} \times 9000 = 6000$ $Q_2 = (Q_1 + Q_2) - Q_1$ $= 9000 - 6000 = 3000$		
Laws (Answer)	$(3.13) \quad a Q_1 v_2 w (1 + m) = v_1 c Q_2$ $\left(\frac{1}{3} \times 6000 \times 1 \times \frac{1}{2} \right) (1 + 1)$ $= 1 \times \frac{2}{3} \times 3000 = 2000$ $[(1000v + 1000m) I = 2000cII]$		

4) The reason why I put $c_1 = c_2 (=c)$, $a_1 = a_2 (=a)$ is because in Marx's following formulas :

$$\frac{v_1 c_1 Q_1}{a_1 Q_1 v_2 w} = \frac{I \quad 4000c}{I \quad 1000v} = 4$$

$$\frac{v_1 c_2 Q_2}{a_2 Q_2 v_2 w} = \frac{II \quad 1000c}{II \quad 500v} = 4$$

"The organic structure of the capital" in the both departments is identical, i.e.

$$\frac{v_1 c_1}{a_1 v_2 w} = \frac{v_1 c_2}{a_2 v_2 w} = 4$$

5) m which should be originally unknown is assumed by Marx to be 100%, and at the same time, by our assumption of $v_2 = 1$ for the simplification, w which should be originally known is treated as unknown. This has of course nothing to do with the theory.