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Features of Shifting Mode of Economic Reproduction

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1. Introduction

- In this session, all papers concern the new theory of shifting mode of reproduction of fixed capital. In this paper, I consider initial definitions and some features of shifting mode of reproduction.

2. The Main Problem

- For about 250 years, the dominant viewpoint in the theory of reproduction has assumed that any economy reproduces its fixed capital and working capital (we denote this activity 'Program A') and *simultaneously* produces consumer goods ('Program B').

- We find this argument indisputable yet insufficient: programs A and B can be simultaneously run at the macro-level, although *in different parts* of the economy both programs may be performed non-synchronously.

3. On Different Parts of the Economy

- Similar to the division of the population of the country into several age groups, the national economy can be represented as a set of sub-systems $G=\{G_1,G_2,\ldots,G_N\}$, where each sub-system (as an object of economic activity) differs from other sub-systems by **an average age** of fixed capital. For instance, in the year t sub-system G_1 is the youngest, and sub-system G_N is the oldest one.

- Let's imagine that each sub-system produces part of the GDP and is capable of running programs A and B *on its own*. These parts of the economy are of particular interest to us.

4. How Sub-systems $G_1, G_2, \dots, G_N$ Work?

- Consider the situation in the year t. In this year, the oldest sub-system G_N

focuses on self-reproduction of fixed capital (**Program A**). Otherwise, it ceases to exist on the grounds of gradual wear on fixed capital. At the same time, other sub-systems can produce consumer goods (**Program B**). For them, there is no immediate danger of dying from depreciation of their fixed capital.

5. Definition of Shifting Mode of Reproduction

- During the year t an old sub-system G_N reproduces fixed capital, becomes a new sub-system and, in the year $t+1$, **shifts** to the Program B. Along with it, sub-systems $G_1, G_2, \ldots, G_{N-2}$ continue running the Program B. Contrariwise, in the year $t+1$, the oldest sub-system G_{N-1} should **shift** to self-reproduction of fixed capital (Program A). We refer to this way of running the programs A and B as a **shifting mode of reproduction**.
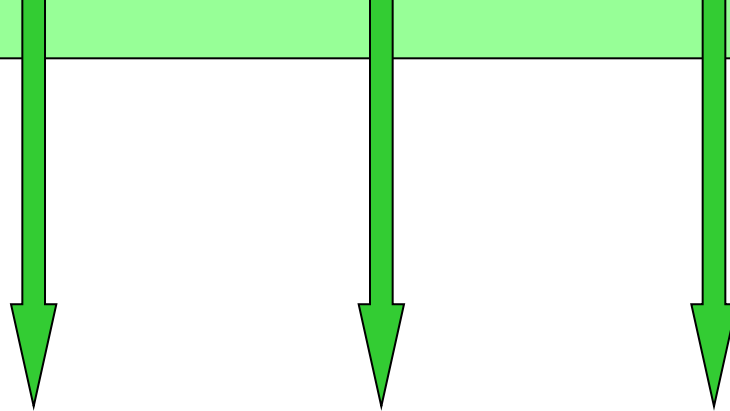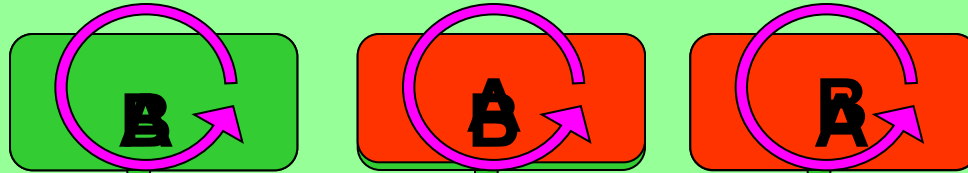
7. The Latency of Shifting Mode

- Shifting mode characterizes each separate sub-system $G_1, G_2, \ldots, G_N$. However, at the macro-level (which **aggregates** those sub-systems) shifting mode becomes **invisible.** At this level, an observer discerns only the simultaneous running of both programs A and B. Perhaps, this latency can explain why shifting mode has not yet been examined by economic theory.

8. Implications of Shifting Mode Analysis

- It will be shown below that some traditional assumptions of economic theory can be complemented or treated unconventionally when seen through the lens of shifting mode of reproduction.

9. Shifting Mode and Movement of Goods

- In economic theory, two types of the models describing the flow of goods coexist, namely circular (close) and linear (open) models. The first class of models has been actively explored by *Pierro Sraffa* and his followers. The idea of linear models is supported by the Austrian school and, partly, by the neoclassic theory. Discussions between both theoretical camps have not yet worn off.

- From the standpoint of shifting mode of reproduction, the movement of flow of goods looks differently. It represents a process of **linear-circular type**.

9a. A Linear-Circular Type Process

- In a set of sub-systems $\{G_1, G_2, \ldots, G_N\}$ an old subsystem G_N in the year t is involved in self-reproduction of fixed capital. It is engaged in a **close, circular** process of capital $\rightarrow$ good $\rightarrow$ capital type. Contrariwise, sub-systems $G_1, G_2, \ldots, G_{N-1}$, producing consumer goods in the same year, are engaged in a **linear** process which is **open** to consumer demand.

- Therefore, in different economic sub-systems we can observe various forms of flow of goods. As time passes, sub-systems change the patterns of their movement. They shift from a linear form to a circular one, and vice versa. This is a linear-circular type process. It means, among other things, that the structure of fixed capital is formed differently that the consumer goods structure.

10. Evolution of Technologies and Competition among Subsystems $G_1, G_2, \ldots, G_N$

- In the evolutionary economic theory, the concepts of changing techno-economic paradigms (Freeman and Perez) or technology modes (Glaziev) retain their popularity. In principle, we agree with these concepts, but we would like to extend their approach.

10a. The Nature of Our Extension

- Under conditions of innovative activity, young sub-systems apply more modern technologies and gain competitive advantages over old sub-systems. These advantages, however, are not likely to bring about the replacement of old sub-systems by new ones. ***Old technologies or technological modes, rather than subsystems, die off***.

10b. Why Old Sub-systems Don't Die?

- Old sub-systems, as objects of economic activity, gradually modernize their fixed capitals. Therefore, they acquire the potential to use more developed technologies than their rivals. Under conditions of shifting mode, old sub-systems become new, and new sub-systems become old. Sure, in certain instances, degradation and even demise of sub-systems are possible, for example, when some sub-system fails to timely modernize its fixed capitals or freezes its innovative activity. Professor Malkoff refers to these instances in the next paper.

11. On Possible Rehabilitation of the Labor Value Concept

- The main benefit of the analysis of shifting mode of reproduction consists in the fresh look at Quesnay-Marx' theory of reproduction and Marx' theory of value. Both theories are currently placed beyond the mainstream and mostly studied in the courses in the history of economic thought.

- To rehabilitate the theory of value and further develop the theory of reproduction, let's first consider the behavior of a separate sub-system G_i.

11a. The Main Feature of Sub-system's G_i Behavior

- A macroeconomic sub-system G_i is **an object of economic activity**, which functions against the backdrop of the generational change of fixed capital. A certain generation of fixed capital within the sub-system G_i has been living for T_L years. During this T_L period, the sub-system spends T_r time period on reproduction of fixed capital, and remaining time $(T_L - T_r)$ on Program B (consumer goods production). We want to emphasize that time period T_r has to exist within the T_L period, because G_i is a self-reproducing sub-system: it reproduces fixed capital (Program A) on its own.

11b. The Main Feature of Sub-system's G_i Behavior, cont'd

- When sub-system G_i runs the Program B during $(T_L - T_r)$ time period, its workers create **labor** value, and its owners sell consumer goods, from which monetary income is formed. When sub-system G_i self-reproduces fixed capital during T_r time period, its workers create **labor** value, but its owners do not sell anything, therefore, they cannot form monetary income. This is the main feature of sub-system G_i functioning in the shifting mode of reproduction.

The Main Feature of Sub-system's G_i Behavior

It creates only the labor value

A	B	B	A	B	B	A
1990	1991	1992	1993	1995	1996	1997
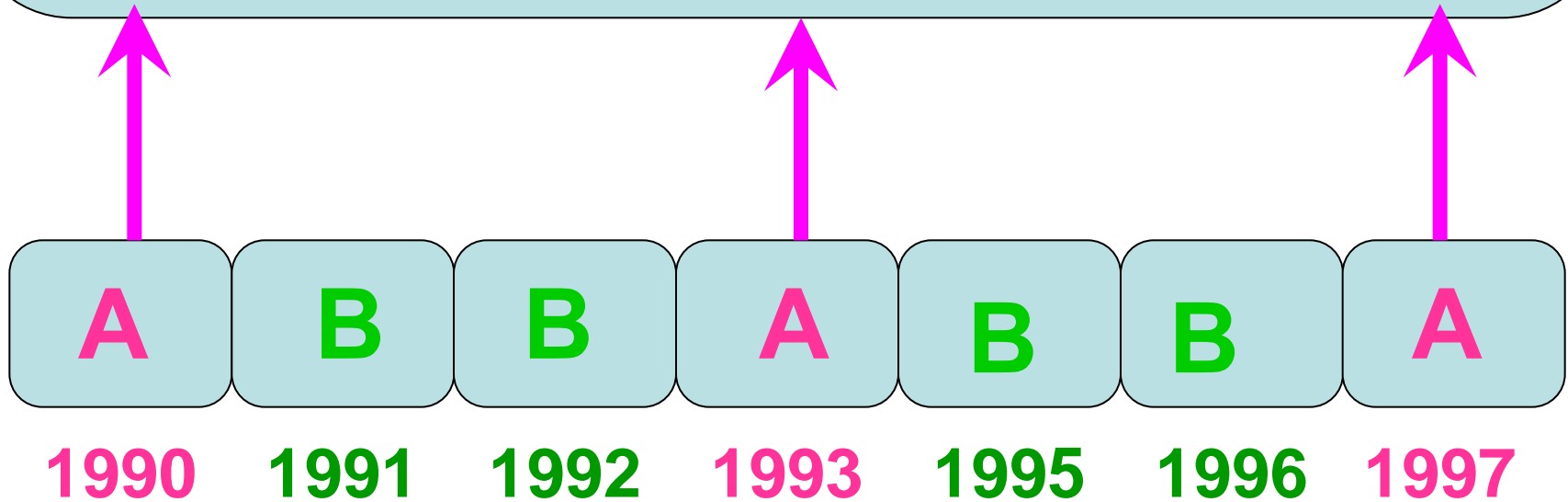
It creates the labor value and the monetary income

12. First Implication of the Main Feature

- If during the period T_r the labor value of **new** fixed capital is created, it means that the value of **actual** (consumed) fixed capital cannot be transferred to the product created by the sub-system in the period T_L. Otherwise, in this product the value of fixed capital is counted **twice**. Therefore, the famous Marx-Quesnay hypothesis proves incorrect: the value of actual fixed capital is not transferred to the product. Until now, economic theory has not noticed this fact.

13. Second Implication of the Main Feature

- The fact that labor value is created in both $(T_L - T_r)$ and T_r periods, while monetary income is formed in $(T_L - T_r)$ period only, means the owners of G_i sub-system have to **redistribute** part of income generated in $(T_L - T_r)$ period in the direction of T_r period. Otherwise these owners are not able to pay wages, taxes and purchase raw materials in T_r period.

- Depreciation is the main form of this redistribution process. Its range depends upon the ratio between the labor values created in $(T_L - T_r)$ and T_r periods. This means, however, that, contrary to Samuelson's view, labor value **does not** represent a superfluous category.

14. Third Implication of the Main Feature

- Since labor value is **a temporal category**, the value ratio under consideration can be approximately assessed through the ratio of economic time indicators $(T_L - T_r)$ and T_r. Therefore, value actually affects on redistribution of monetary income. Not only is value **not** redundant, it also becomes a key operational category under conditions of shifting mode of reproduction. For economic theory, this category is as important as the notion of utility.

15. Fourth Implication of the Main Feature

- The very fact of redistribution of monetary income means that an analysis of shifting mode of reproduction is not possible without accounting for monetary circulation in reproduction process. Marx paid great attention to this problem. But he failed to show how 'amortized' money moved within the I division of public production. The reason behind that is that Marx did not consider shifting mode of reproduction in his framework. We have overcome this hindrance. In his paper, Professor Malkoff suggests the model of shifting mode of reproduction, which accounts for the movement of 'amortized' money.

16. Conclusion

- It can be seen that the concept of shifting mode of reproduction concerns a number of important issues in the fundamental economic theory and brings forward some corrections and additions to it. Next paper illustrates the perspectives of applying shifting mode to mathematical modeling of economic growth.

Many thanks for your attention