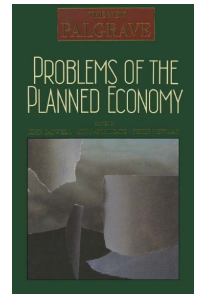


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Fel'dman was one of the founders of the theory of economic growth under socialism, the economics of planning and development economics. An electrical engineer by profession, he worked in Gosplan from February 1923 to January 1931. It was in this period that his contribution to economics was made. At first he was in the department analysing and forecasting developments in the world economy (he concentrated on Germany and the USA). His first work on the theory of growth was a comparative study of the structure and dynamics of the US economy in 1850–1925 with projections of the Soviet economy between 1926/27 and 1940/41. His most important work ('On the theory of the rates of growth of the national income') was a report to Gosplan's committee for compiling a long-term plan for the development of the national economy of the USSR. It was published in two parts in Gosplan's journal in 1928. A year later Fel'dman published a paper which provides a more popular presentation of how to utilize his ideas to calculate long term plans. The ideas of Fel'dman formed the methodological basis for the preliminary draft of a long term plan worked out by the committee, then headed by N.A. Kovalevskii. This draft was discussed at meetings of Gosplan's economic research institute in February and March 1930. Apart from this serious discussion, during 1930 Fel'dman came under public attack for his ideas. His reliance on mathematics and his lack of fanaticism did not fit in well with the political fervour of 1930. The concrete numerical work of Fel'dman and Kovalevskii in 1928/30 was much too optimistic. It treated as feasible entirely unrealizable goals. The attempt to realize them had disastrous effects on the economy. Unfortunately, the political situation in the USSR prevented Fel'dman from publishing anything on economics after 1930. Even when, in 1933, he reverted from the sensitive subject of socialist industrialization to the problems of capitalist growth, his book was not published.

As far as growth theory is concerned, Fel'dman's work was much in advance of contemporary Western work. He developed a two-sector growth model and

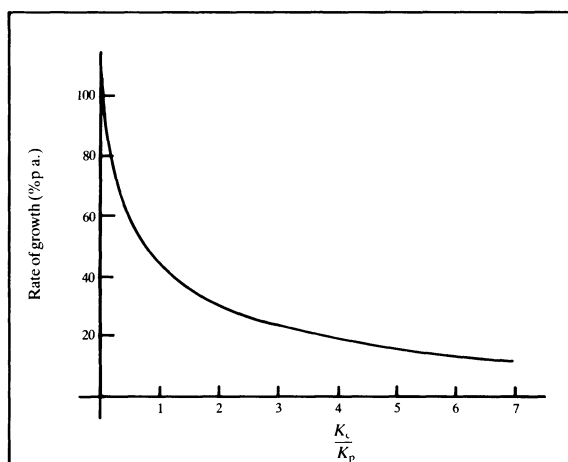


Figure 1 Fel'dman's first theorem, K_c is the capital stock in the consumer goods industry. K_p is the capital stock in the producer goods industry.

showed how different growth rates implied different economic structures. He derived two important results, one about the ratios of the capital stocks in the two sectors, the other about the allocation of investment between the two sectors. The first result is that a high rate of growth requires that a high proportion of the capital stock be in the producer goods sector. This is illustrated in Figure 1. Fel'dman's second theorem is that, along a steady growth path, investment should be allocated between the sectors in the same proportion as the capital stock. For example, suppose that a 20 per cent rate of growth requires a K_c/K_p of 3.7. Then to maintain growth at 20 per cent p.a. requires that 3.7/4.7 of annual investment goes to the consumer goods industries and 1.0/4.7 of annual investment goes to the producer goods industries.

The interrelationship between the two theorems is shown in Table 1, in which Fel'dman explained how any desired growth rate, given the capital-output ratio,

Table 1 Fel'dman's two theorems

$\frac{K_p}{K_c}$	$\frac{dY}{dt}$ (in % p.a.) (when $K/Y = 2.1$)	$\frac{\Delta K_p}{\Delta K_c + \Delta K_p}$
0.106	4.6	0.096
0.2	8.1	0.167
0.5	16.2	0.333
1.0	24.3	0.500

determined both the necessary sectoral composition of the capital stock and the sectoral allocation of investment.

Given the capital–output ratio, the higher the K_p/K_c ratio, i.e. the greater the proportion of the capital stock in the producer goods sector, and correspondingly the higher the $\Delta K_p/(\Delta K_c + \Delta K_p)$ ratio, i.e. the greater the proportion of new investment in the producer goods sector, the higher the rate of growth. With a capital–output ratio of 2.1, to raise the growth rate from 16.2 to 24.3 per cent requires raising the proportion of the capital stock in the producer goods sector from $\frac{1}{3}$ to $\frac{1}{2}$, and the share of investment in the producer goods sector from $\frac{1}{3}$ to $\frac{1}{2}$.

The conclusion Fel'dman drew from his model was that the main tasks of the planners were to regulate the capital–output ratios in the two sectors and the ratio of the capital stock in the producer goods sector to that in the consumer goods sector. For the former task, Fel'dman recommended rationalization and multi-shift working, for the latter, investment in the producer goods sector.

As far as the economics of planning is concerned, the main lesson to be learned from the Fel'dman model is that the capacity of the capital goods industry is one of the constraints limiting the rate of growth of an economy. There may well be other constraints, such as foreign exchange, urban real wages or the marketed output of agriculture. (Indeed, it is possible that one or more of these is/are the binding constraint/s and that the limited capacity of the producer goods sector is a non-binding constraint.) Economic planning is largely concerned with the removal of constraints to rapid economic growth. Accordingly, a planned process of rapid growth may require that the planners stimulate the rapid development of the producer goods sector.

As far as development economics is concerned, Fel'dman is important because of the argument in his 1928 paper that 'an increase in the rate of growth of income demands industrialization, heavy industry, machine building, electrification ...'. When first formulated, this conclusion struck many economists as counter-intuitive and paradoxical.

Fel'dman's work, as is natural for a pioneer, suffers from serious limitations. As far as the theory of economic growth under socialism is concerned, he was an important early contributor, but his work has to be complemented by Kalecki's emphasis on the limits of growth and Kornai's emphasis on the behavioural regularities actually generating the growth process. As for the economics of planning, his arguments have to be complemented by a proper understanding of the role of agriculture, foreign trade and personal consumption and of the danger of an over-accumulation crisis. In development economics, experience in the USSR in the 1930s, India in the 1950s and China in the Maoist period has shown the limitations of a narrowly Fel'dmanite approach.

A brilliant pioneer, Fel'dman's work was ended after only a few years by the Stalinists.

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