No. 41

79-5

Basic Human Needs versus Economic Growth Approach for Coping with Urban-Rural Imbalances: An Evaluation Based on Relative Welfare*

April 1979

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* The original version of this paper was presented at the Conference on World Regional Development and Planning, August 21 - 23, 1978, at the University of Tsukuba.

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Introduction

In recent papers of mine, Mera (1977) and (1978), I have demonstrated on the basis of the development experiences of Japan and Korea that economic development not only raises the average per capita income but also reduces income disparity among regions and thereby reduces the magnitudes of other regional problems such as massive flows of migration out of less developed regions and concentration of population in large metropolitan areas. One implication of this proposition is that the direct policy for reducing interregional disparity through a transfer of resources to less developed regions may be an inferior way to the alternative way of accelerating the growth of the economy, even for reducing interregional disparity, not to mention for achievement of the growth objective.1/

The above proposition of mine is derived from the following series of propositions: (1) economic development, when the level of development goes beyond a certain critical level, the interregional disparity starts narrowing down, (2) when the interregional disparity narrows down, the migration of population from less developed to more developed regions declines, and (3) the reduction in migratory flows eases the problems associated with accommodating incremental population in the receiving region and also the problems associated with the sense of deprivation in the sending regions.2/ Thus, the urban-rural imbalances

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1/ For example, Friedmann and Douglass (1975) advocates a strategy for directly improving less developed regions.

2/ This series of propositions is in line with the traditional approach to development for labor surplus economies as demonstrated, for example, by Fei and Ranis (1964).

are considered to be a temporary problem which can be overcome in a shorter span of time by accelerating the growth rate of the economy.

This economic development approach to solving the problem of urban-rural imbalances would be undoubtedly a preferred one for fast growing countries such as Korea and Taiwan because the period of endurance, i.e., the number of years before significant narrowing down of the interregional disparity sets in, is relatively short. But, for slowly developing countries, it might not be the most preferred approach because the period of endurance might not be felt as temporary.

In what follows, I shall attempt to formalize the above propositions into a mathematical simulation model in order to identify the conditions in which the economic development approach is a preferred one. A country will be divided into two sectors; urban and rural, the former being the more developed and the latter the less developed part of the country. It is further assumed that the urban sector contains the modern and highly productive subsectors but the rural sector is characterized by labor surplus and low labor productivity. The model would, therefore, be particularly relevant to most of Asian countries.

The alternative strategy is to improve the welfare in the rural sector directly by allocating resources into the rural sector. Such a strategy is frequently advocated by many in recent years for the purpose of meeting the "basic human needs." This strategy calls for investment in infrastructure in the rural areas and also the provision of basic services such as education, medical and community services. This strategy would improve the welfare of the rural population immediately, but since most of allocated resources are not used for directly productive purposes, the long-run implication of this strategy may be a slower growth, if not stagnation, of the economy.

Basic Assumptions

Although income disparity between the urban and rural sectors is partly due to differences in ownership of productive assets, the major factor for disparity is assumed to be the difference in the wage income.[3/] This assumption is made not because the non-wage income is insignificant, but because the income disparity of wage earners in the two sectors is the practical issue for policy decision.

It is a well-known fact that the urban wage income per worker is much higher than the rural wage income in most of developing countries. This is an aspect of economic dualism which characterizes most of presently developing countries. However, the experience of Japan shows that the wage disparity has been progressively eliminated as the economy developed.[4/] Therefore, it is assumed here that the ratio of the rural wage income per worker to the urban wage income per worker is an increasing function of development.[5/] For the purpose of this model,

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3/ This assumption can also be derived from the assumption that the total income in each sector is a fixed multiple of the wage income, as presented below.

4/ In Japan, the lowest wage rate for fresh junior high school graduates among 46 prefectures in 1965 was 62 percent of the highest, but in 1975 it was 69 percent.

5/ Fei and Ranis (1975) on Korea and Taiwan shows that the relative positions of rural and urban wage did not materially change over a period of more than 10 years. However, the wage in their study apparently refers to wage income of hired manual workers who might move marginally between the agricultural and industrial sectors. As a result, the agricultural wage is about 90 percent of the industrial wage. On the other hand, the rural-urban income gap is much greater and cannot be explained by a difference in income from asset ownership. Therefore, the difference in the imputed wage rate between the two sectors must be much greater.

the level of development is measured by the proportion of population or labor force in the urban sector.[6] Assuming that the relationship is linear and the disparity disappears when the rural sector approaches to nil, then the following relationship holds:

$$R_t = \frac{w_{rt}}{w_{ut}} = a + (1-a)u_t, \quad 0 < a < 1 \tag{1}$$

where

$$u_t = \frac{P_{ut}}{P_t}, \tag{2}$$

R_t is the ratio of the rural to the urban wage income per worker, w_{rt} and w_{ut} are the rural and urban wage income per worker, respectively, a is a constant, P_{ut} and P_t are the urban and the total population, respectively, all in year t. u_t is the proportion of the urban population in year t and is related to R_t as shown in Figure 1.

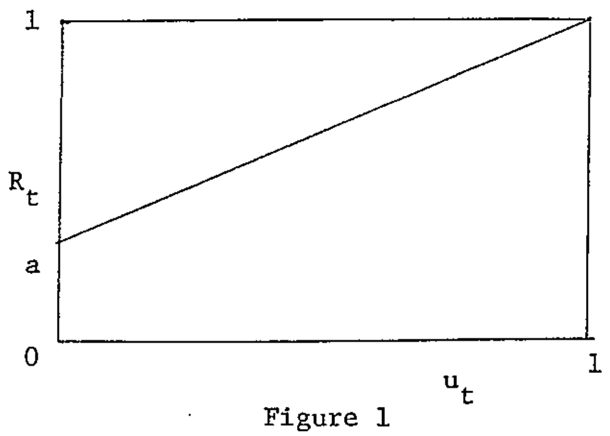

Figure 1

The Relationship of R_t with u_t

6/ For the purpose of this analysis, population and labor force are taken to be synonymous. This assumption is possible as long as the ratio of labor force to population is equal in both sectors. For numeric representations, labor force rather than populatin will be the basis.

The population size of the urban sector can be changed by investment and the change in the urban wage rate. The change in the total urban wage bill should be equal to the wage share of the income increment created by urban investment:

$$w_{ut} P_{ut} - w_{u\,t-1} P_{u\,t-1} = \frac{d}{c} I_{u\,t-1} \qquad (3)$$

where c is the capital-output ratio, d is the wage share in total income, and $I_{u\,t-1}$ is the amount of investment made in the urban sector in year $t-1$. The urban wage rate is assumed as a function of u_t which is the principal indicater of the level of development. Specifically, the following is assumed:

$$w_{ut} = \frac{h}{1 - u_t} \qquad (4)$$

where h is a constant.

The above equations represent the central assumptions of this model. For closing the system, the following will be assumed: the total population is the sum of the urban and the rural population, and increases at a constant rate, the total investment is divided into the urban investment and the rural investment, the total investment is a fixed fraction of the national product, and the national product is a constant multiple of the total wage income. These can be expressed by the following equations:

$$P_t = P_{ut} + P_{rt} = (1+n)P_{t-1} \qquad (5)$$

$$I_t = I_{ut} + I_{rt} \qquad (6)$$

$$I_t = sY_t, \qquad 0 \leq s \leq 1 \qquad (7)$$

$$Y_t = \frac{1}{d}(w_{ut}\ P_{ut} + w_{rt}\ P_{rt}), \qquad 0 < d < 1 \tag{8}$$

where P_{rt} is the rural population, I_{rt} the amount of investment in the rural sector, Y_t the national product all at year t, and n and s are constants.

To the system presented above, a new element will be introduced: resource allocation for basic human needs. The role of this resource allocation is assumed to raise the level of welfare in the rural sector above the level represented by the wage income. Specifically, it is assumed that a part of the rural "investment" will be used in the form of a flow of services for meeting basic human needs and the other part will be used as investment for expanding the stock of rural infrastructure for meeting basic human needs. As a result, it is assumend that the rural welfare is raised above the level represented by the wage income:

$$w^*_{rt} = w_{rt} + f(w^*_{r\,t-1} - w_{r\,t-1}) + g\frac{I_{rt}}{P_{rt}},$$

$$0 < f,\ g < 1 \tag{9}$$

where w^*_{rt} is the welfare level in the rural sector and f and g are constants. g represents the fraction of the rural "investment" used for current services plus the benefit derived in the first year from infrastructure investment and f the net-of-depreciation rate of the infrastructure stock inherited from the preceding year multiplied by the fraction of the rural investment used for infrastructural investment.[7/] Now, the ratio

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7/ The benefits of infrastructural services are considered here to be of public goods once infrastrure is provided in the sense that the benefit level is independent of the population who receives them. With this assumption the year-to-year change in the rural population is disregarded in the second term of the sight hand side of equation (9).

$$R_t^* = A + B + fB + f^2B + \ldots + f^{t-1}B$$

where

$$A = R_t = R_o$$

and B is a positive constant representing the third term in equation (16). Therefore, R_t^* approaches asymptotically to $A + \frac{B}{1-f}$. Where population increases, R_t^* declines after a certain rise during initial years. These cases are illustrated in Appendix Figures 11 and 14 for cases 25 and 36.

Now we proceed to the heart of the problem. Normally, economists compare situations on the basis of the level of individuals' utility without regard to neighbors' or other regions'. But, in what follows the performance will be evaluated solely on the basis of the relative position of the rural sector to the urban counterpart. Even though w_{rt}^* or w_{rt} may increase absolutely as u_t increases, we are not concerned with this at the moment; and instead, are concerned with R_t^*. In other words, we assume here that the welfare of the worse-off is determined by its position relative to the better-off.

Generally, with the policy of fastest urban growth, i.e., $v = 1$, u_t goes up fastest and, as a result, R_t^* keeps going up and will move above the level achievable with the policy of no urban investment, i.e., $v = 0$, within a certain period. With the policy of 50-50 split to urban and rural investment, R_t^* also keeps going up. Therefore, if the rural population has a high degree of patience or a very low rate of discount for future welfare, a policy of some urban invstment will be preferred to the policy of no urban invstment. If they are very impatient, the total basic human needs approach will be most preferred.

We shall not attempt to measure the degree of impatience which the population has, thereby trying to find the optimal value of v . Instead, we shall show the approximate span of time for which patience is needed for each alternative value of v . Such time spans are shown in Tables 2 through 4 for each case examined. For ready understanding, the following designation will be used for identification of alternative policies:

Policy 1 for $v = 0$

Policy 2 for $v = 0.5$, and

Policy 3 for $v = 1.0$.

Table 2 The Number of Years Needed for Policy 2 to Catch up Policy 1: Performance Measured by R_t*

		u_o	s		
			0.05	0.1	0.2
n	0.00	0.1	7	7	6
		0.2	9	8	7
		0.3	12	10	9
		0.4	15	13	11
	0.01	0.1	7	7	6
		0.2	9	8	7
		0.3	11	10	9
		0.4	14	13	11
	0.02	0.1	8	7	6
		0.2	9	8	7
		0.3	11	10	9
		0.4	14	12	10

Table 3 The Number of Years Needed for Policy 3 to Catch up Policy 1: Performance Measured by R_t^*

		u_o	s: 0.05	s: 0.1	s: 0.2
n	0.00	0.1	8	8	8
		0.2	10	10	10
		0.3	13	14	16
		0.4	19	20	32
	0.01	0.1	8	8	8
		0.2	10	10	10
		0.3	13	13	14
		0.4	17	18	22
	0.02	0.1	8	8	8
		0.2	10	10	10
		0.3	12	12	13
		0.4	16	16	18

Table 4 The Number of Years for Policy 3 to Catch up Policy 2: Performance Measured by R_t^*

		u_o	s: 0.05	0.1	0.2
n	0.00	0.1	8	9	12
		0.2	11	13	∞
		0.3	16	∞	∞
		0.4	25	∞	∞
	0.01	0.1	8	9	11
		0.2	11	12	∞
		0.3	14	19	∞
		0.4	20	∞	∞
	0.02	0.1	9	9	11
		0.2	11	12	∞
		0.3	14	17	∞
		0.4	18	29	∞

These tables indicate that for countries with a low level of urbanization of some 20 percent or less, Policy 2 will catch up Policy 1 (as measured by R_t^*) in more or less 10 years, and Policy 3 will catch up Policy 1 more or less in 10 years, also. In addition, Policy 3 will catch up Policy 2 more or less within a similar time span. R_t^* grows greater with Policy 3 than with Policy 2 after some ten years, as seen in Appendix Figures 2 and 11 for cases 1 and 25, respectively. Therefore, as long as the rural population is prepared to go through such a period of endurance, Policy 3 would be preferred most.

The situation is different for a country with a relatively high rate of urbanization, e.g., 40 percent and a high savings ratio, e.g., 20 percent. In such cases, Policy 2 catches up Policy 1 in about 10 years, but Policy 3 cannot catch up Policy 1 in such a short span of time. More importantly, Policy 3 cannot catch up Policy 2 fore-ever as shown in Appendix Figures 8 and 14 for cases 12 and 36, respectively. Therefore, in these cases, Policy 2 will be definitely preferred to Policy 3. For these countries, there are cases in which Policy 3 takes over Policy 2 within a short span of time, but is taken over soon afterwards by Policy 2, as seen in Appendix Figures 5 for case 3. In such a case, given some patience on the part of rural population, the optimal policy would be to switch from Policy 3 to Policy 2 during the period in which Policy 3 dominates over Policy 2.

Conclusions

The analysis of alternative development strategies for coping with urban-rural imbalances presented above has led to the follwoing conclusions. First, the inverted-U shaped curve of urban-rural disparity which is supposed to be followed when a country goes through stages of development is likely due to expansion of the share of a minority group rather than expansion of the gap in the earning capability between the two sectors. Second, even if the development policy is to be determined by the relative position of the rural population to the urban, the policy of fastest economic growth (Policy 3) may be the most preferred one for countries with a low level of development, as long as the rural population is prepared to be patient for some ten years. For countries with a higher level of development and a higher savings ratio, a more welfare oriented approach warrants serious consideration. Thus, for a specific country which is in the early stage of development, the above results imply that the "growth-first and redistribution-later" strategy would be a reasonable choice even if the performance of development is measured by the relative position of the rural sector to the urban sector.

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Appendix

Notes: 1. Arabic numbers, 1, 2 and 3 in the diagrams refer to the performances of the system with respect to the variables indicated, when Policies 1, 2 and 3 are pursued, respectively.

2. Arabic numbers outside of the diagram on the right imply that the performances of the system with respect to the variable indicated, corresponding to the policies indicated by the numbers are at the same level for the year indicated by the numbers.

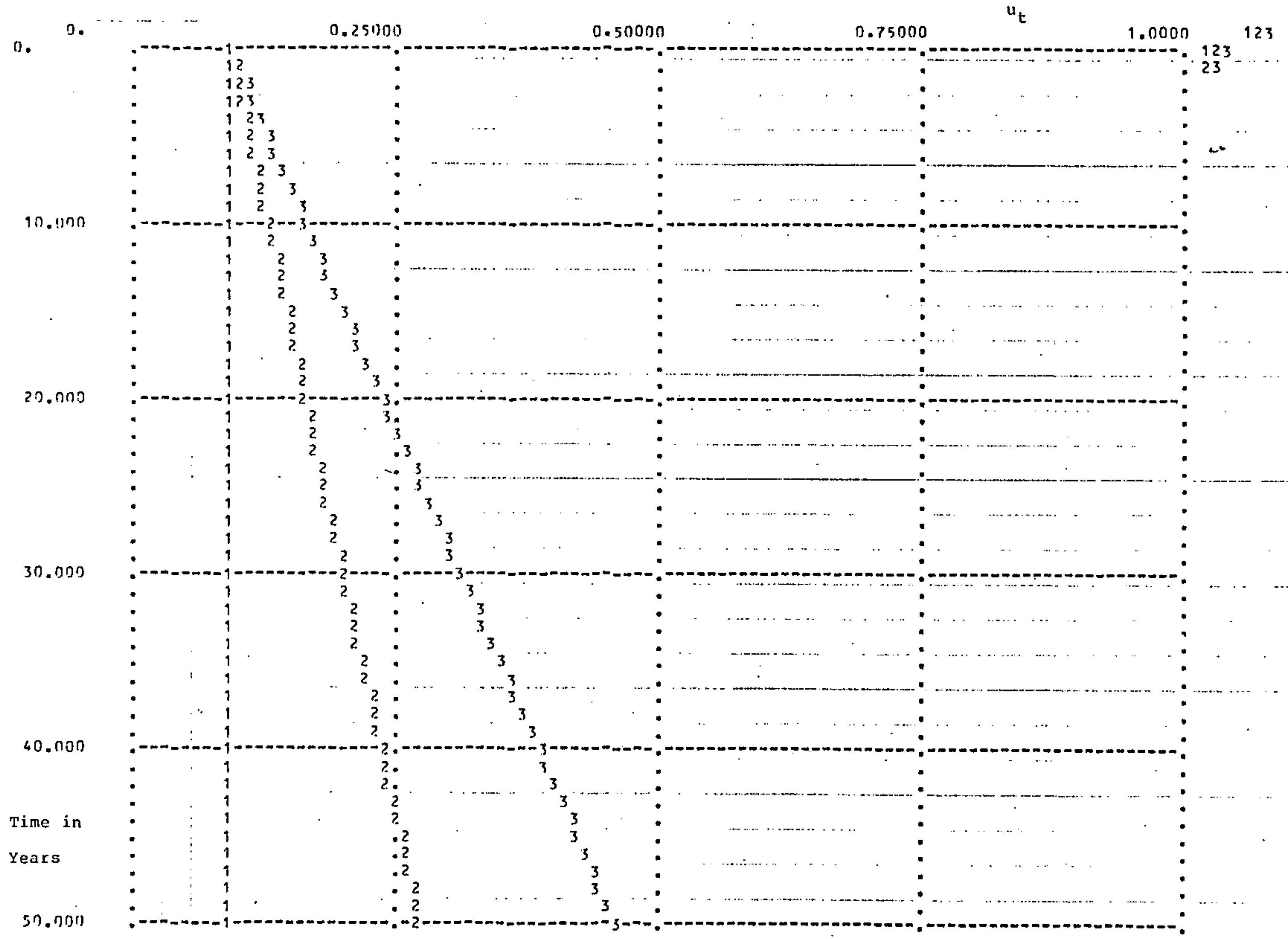

Figure 1 Paths of u_t for Three Alternative Policies: Case 1 ($n = 0.00$, $u_o = 0.1$, $s = 0.05$)

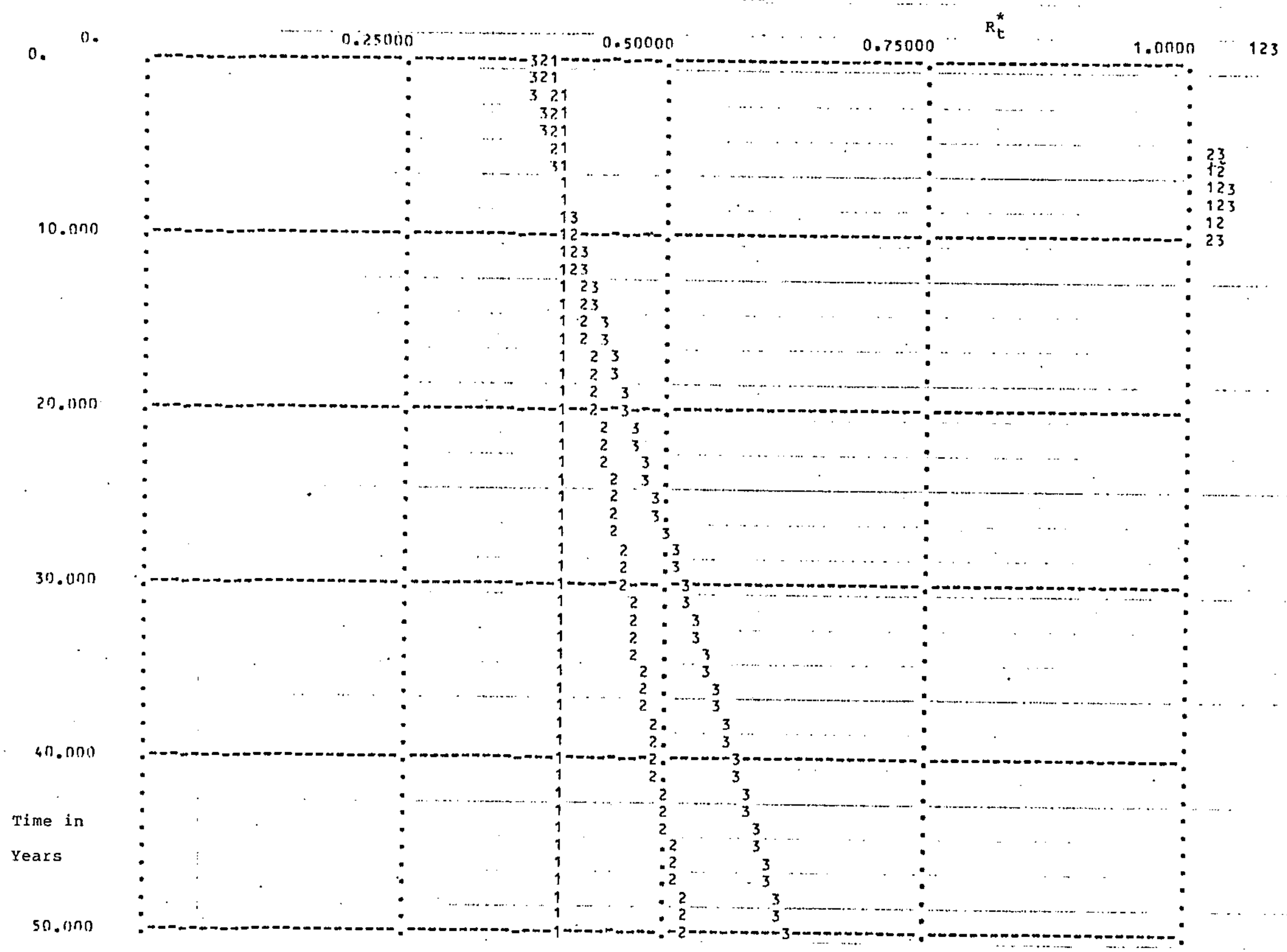

Figure 2 Paths of R_t^* for Three Alternative Policies: Case 1 ($n = 0.00$, $u_o = 0.1$, $s = 0.05$)

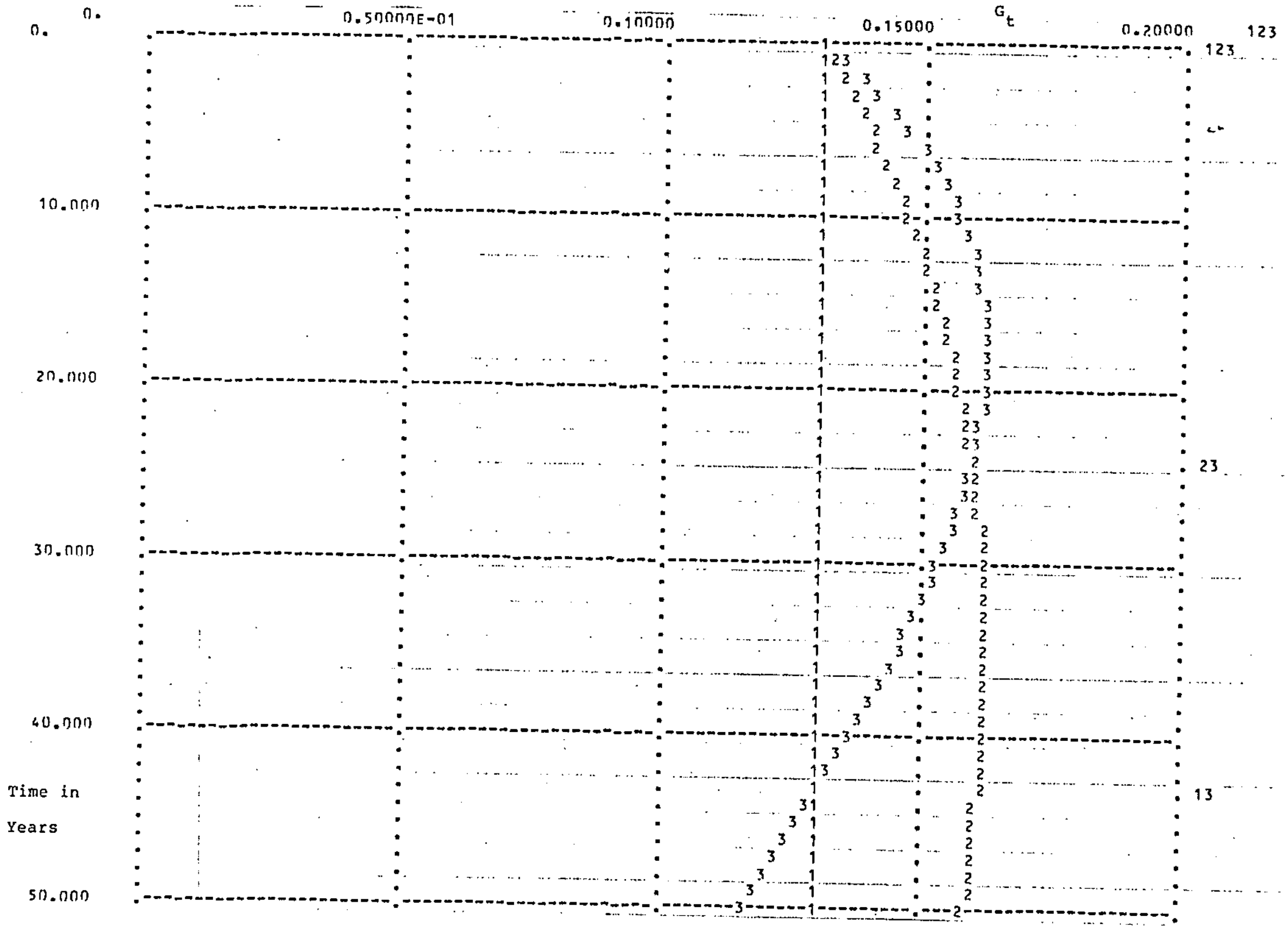

Figure 3 Paths of G_t for Three Alternative Policies: Case 1 ($n = 0.00$, $u_o = 0.1$, $s = 0.05$)

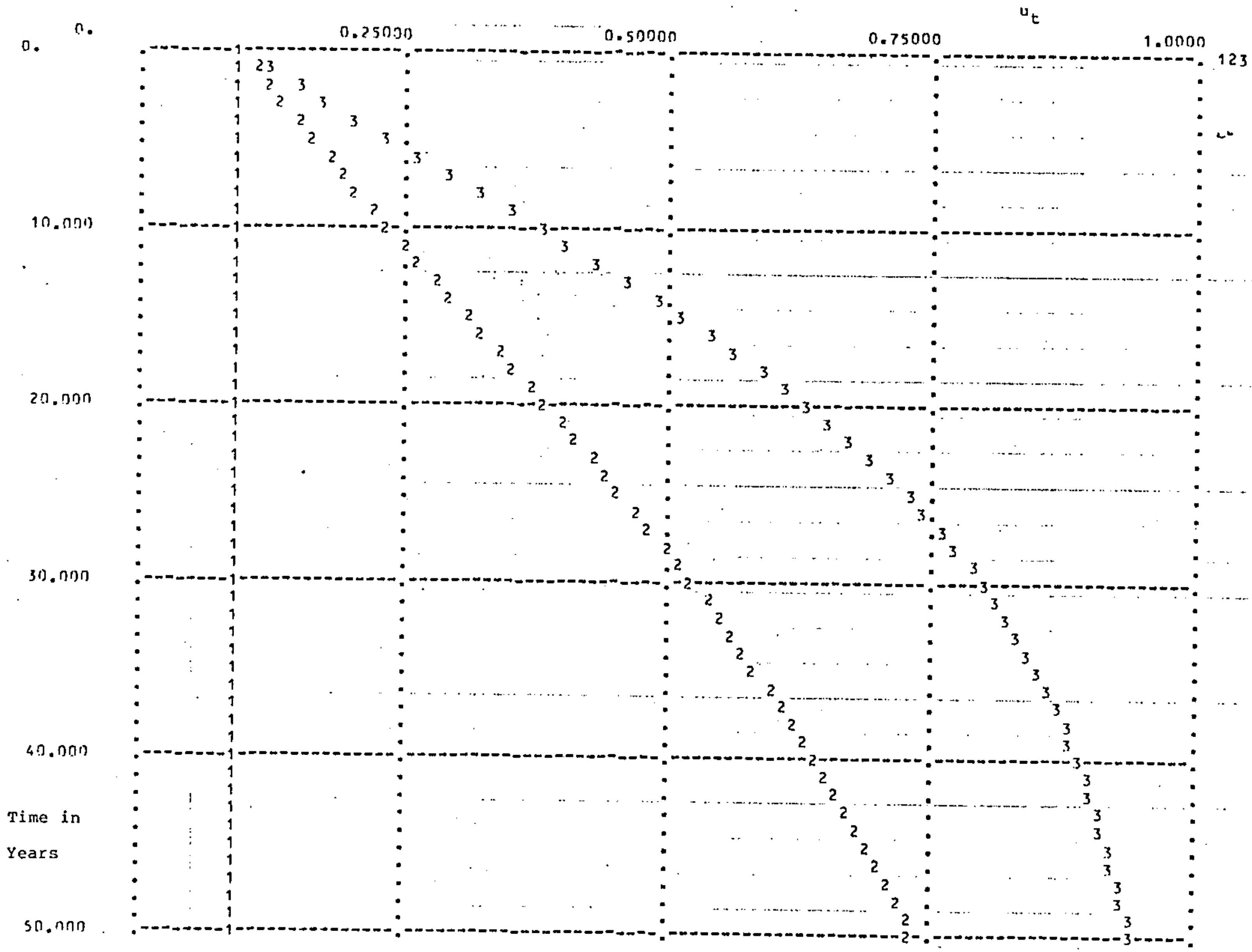

Figure 4 Paths of u_t for Three Alternative Policies: Case 3 ($n = 0.00$, $u_o = 0.1$, $s = 0.2$)

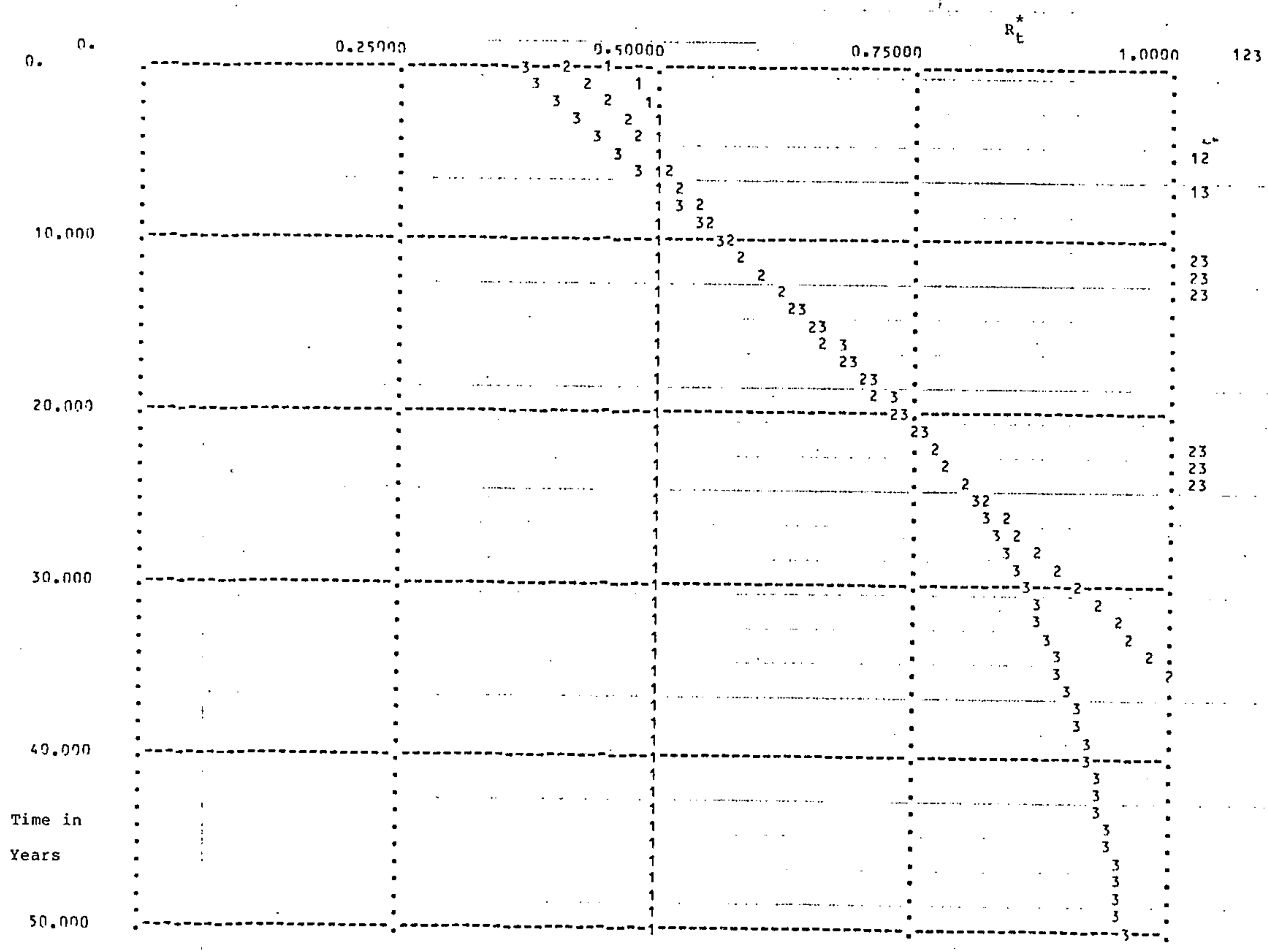

Figure 5 Paths of R_t^* for Three Alternative Policies: Case 3 ($n = 0.00$, $u_o = 0.1$, $s = 0.2$)

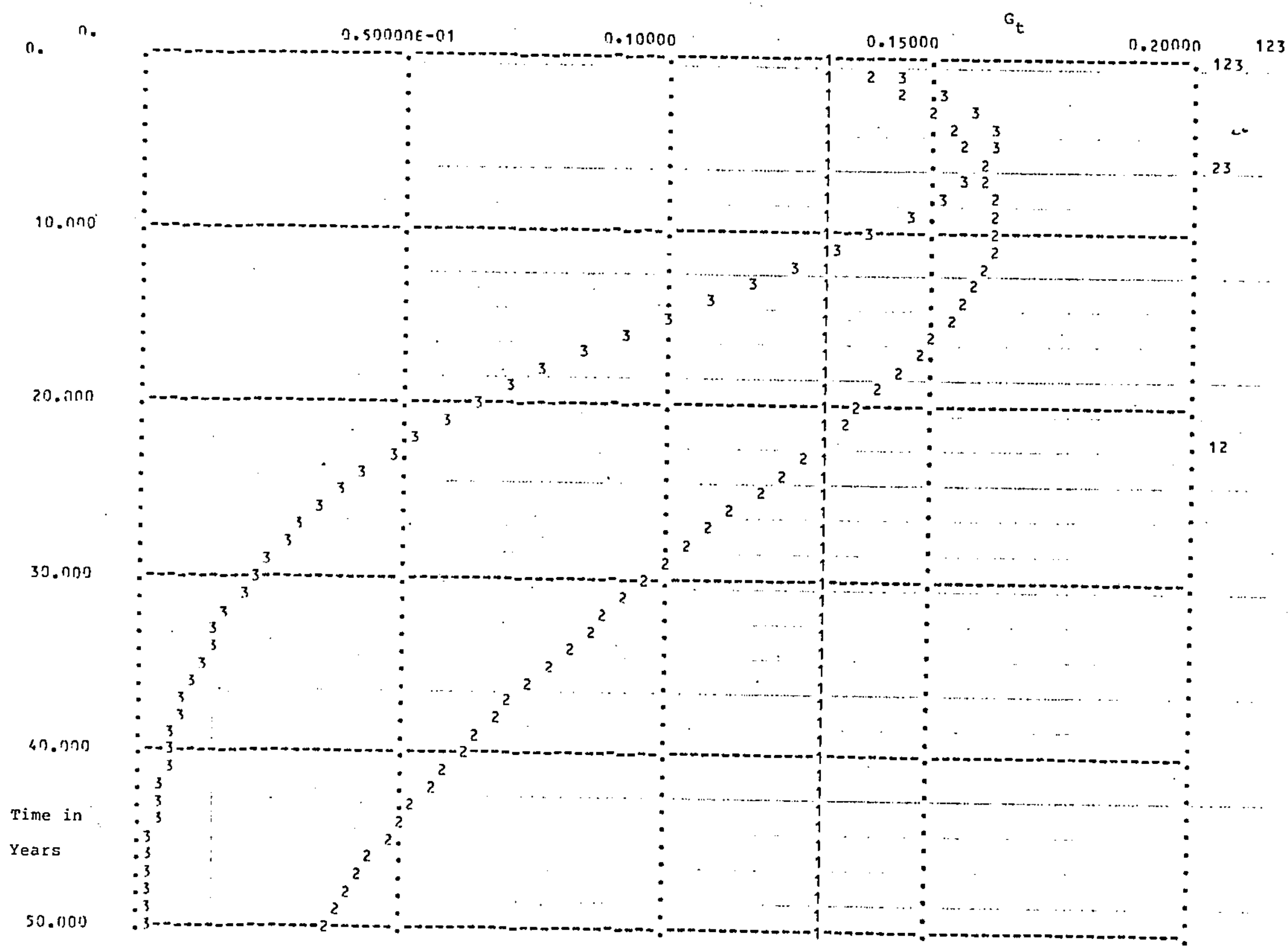

Figure 6 Paths of G_t for Three Alternative Policies: Case 3 ($n = 0.00$, $u_o = 0.1$, $s = 0.2$)

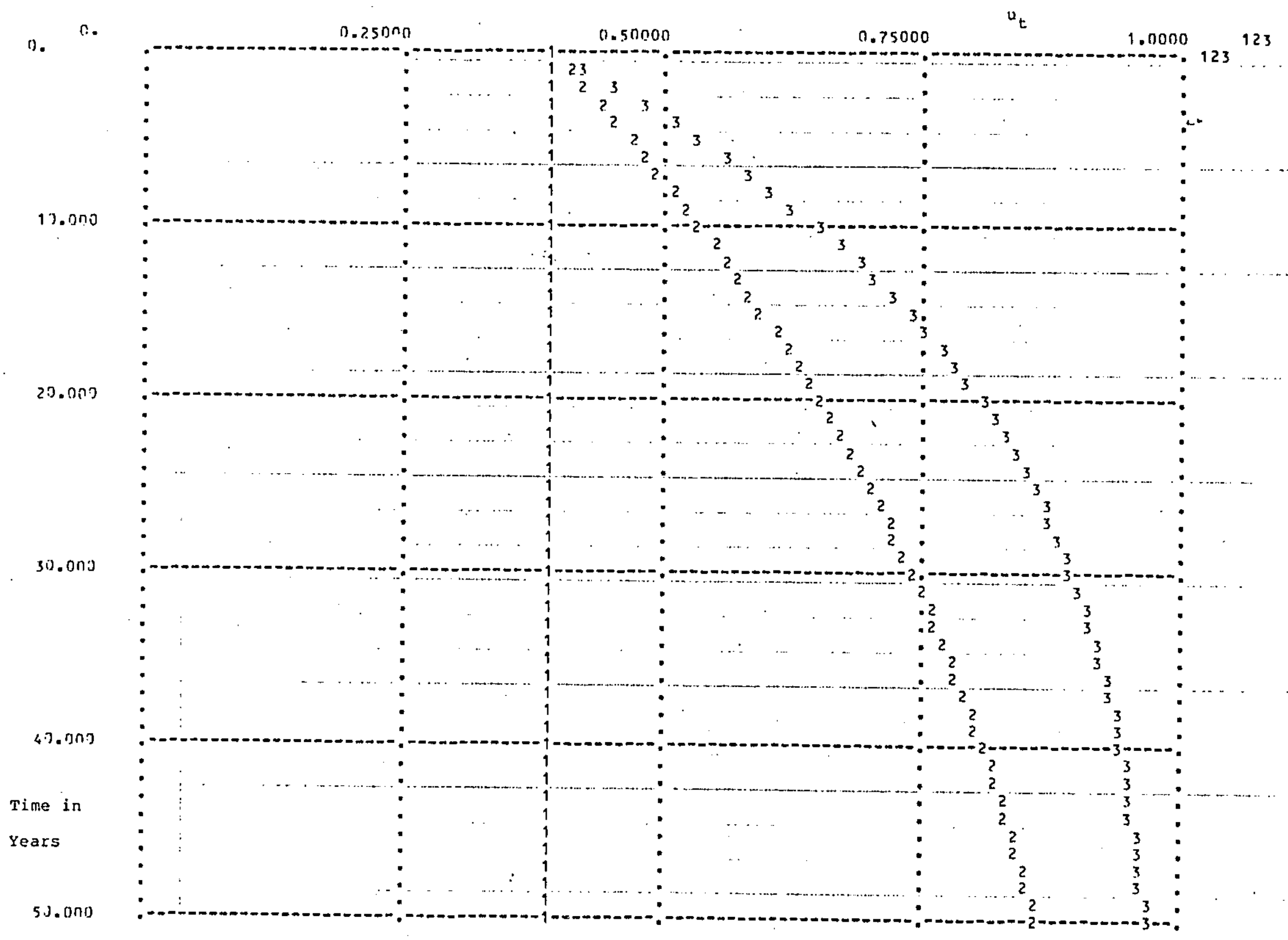

Figure 7 Paths of u_t for Three Alternative Policies: Case 12 ($n = 0.00$, $u_o = 0.4$, $s = 0.2$)

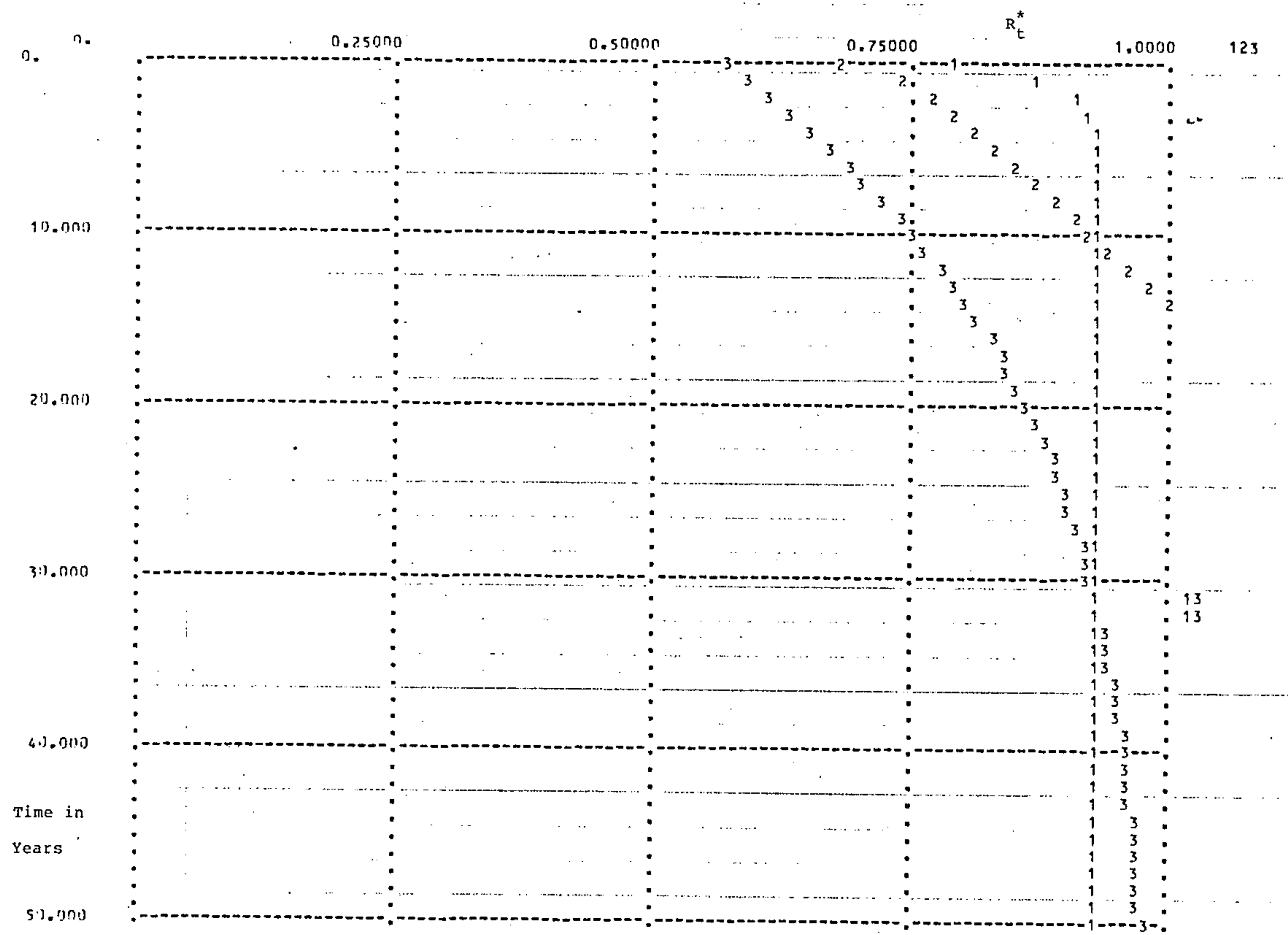

Figure 8 Paths of R_t^* for Three Alternative Policies: Case 12 ($n = 0.00$, $u_o = 0.4$, $s = 0.2$)

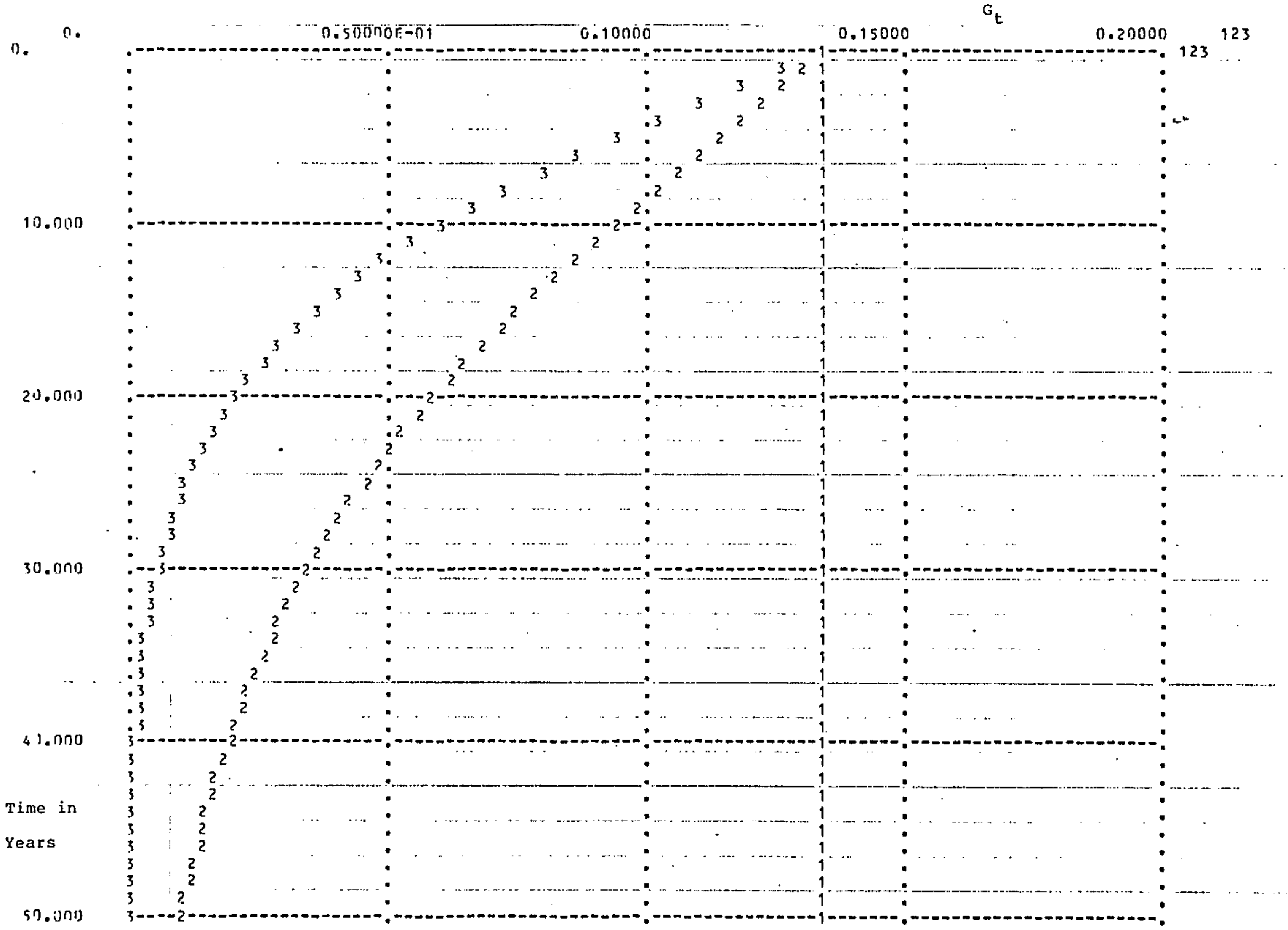

Figure 9 Paths of G_t for Three Alternative Policies: Case 12 ($n = 0.00$, $u_o = 0.4$, $s = 0.2$)

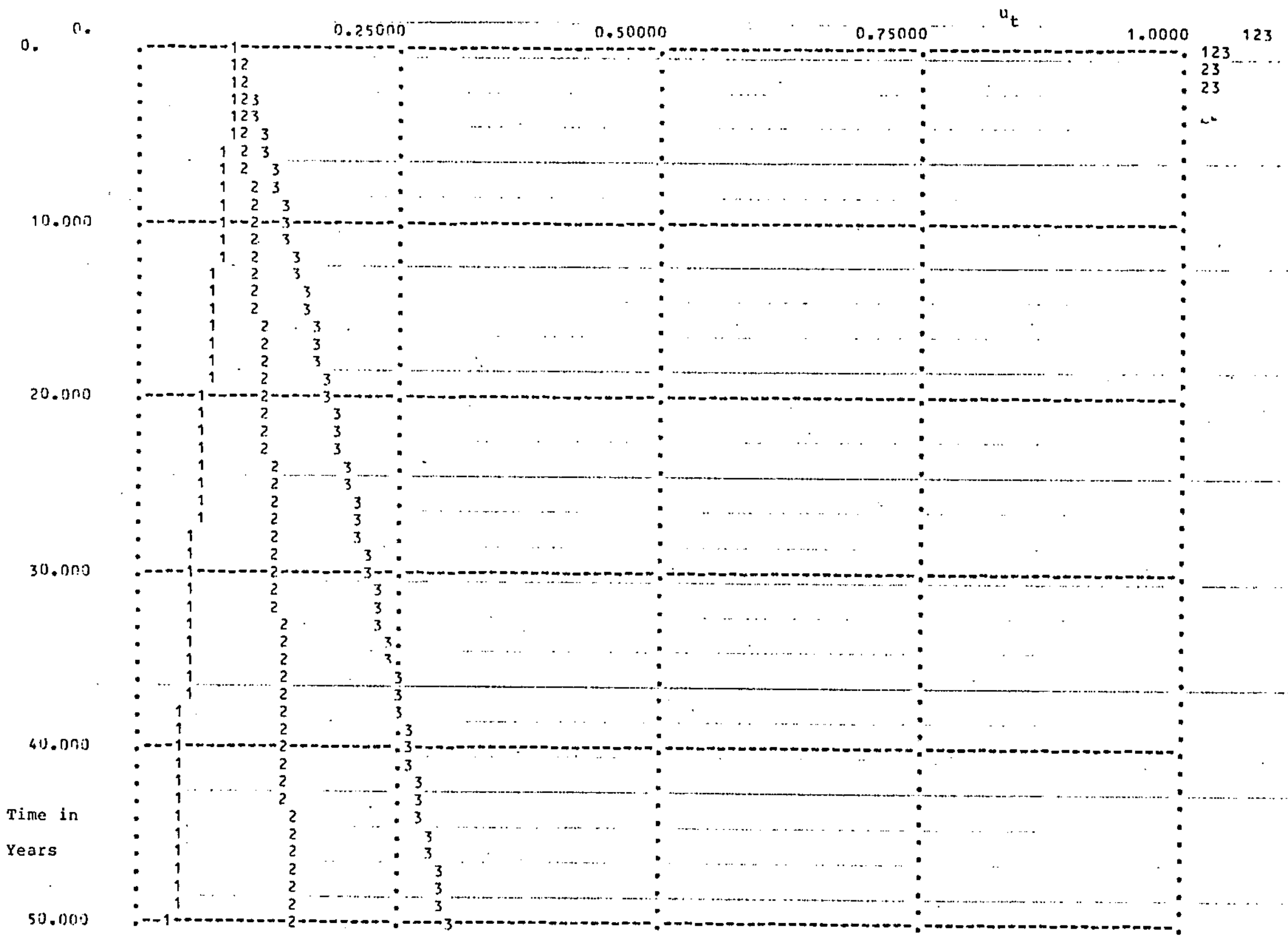

Figure 10 Paths of u_t for Three Alternative Policies: Case 25 ($n = 0.02$, $u_o = 0.1$, $s = 0.05$)

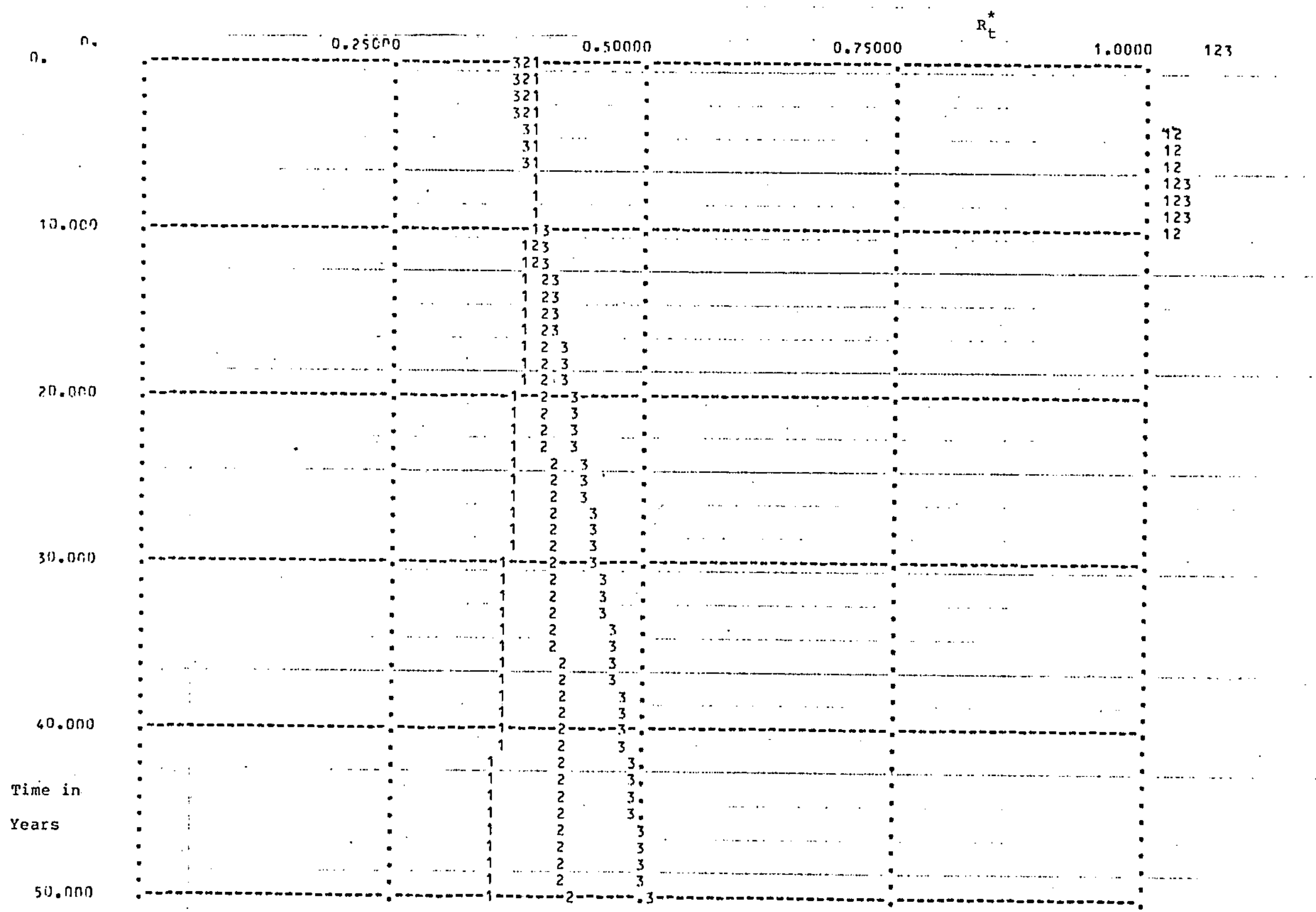

Figure 11 Paths of R_t^* for Three Alternative Policies: Case 25 ($n = 0.02$, $u_o = 0.1$, $s = 0.05$)

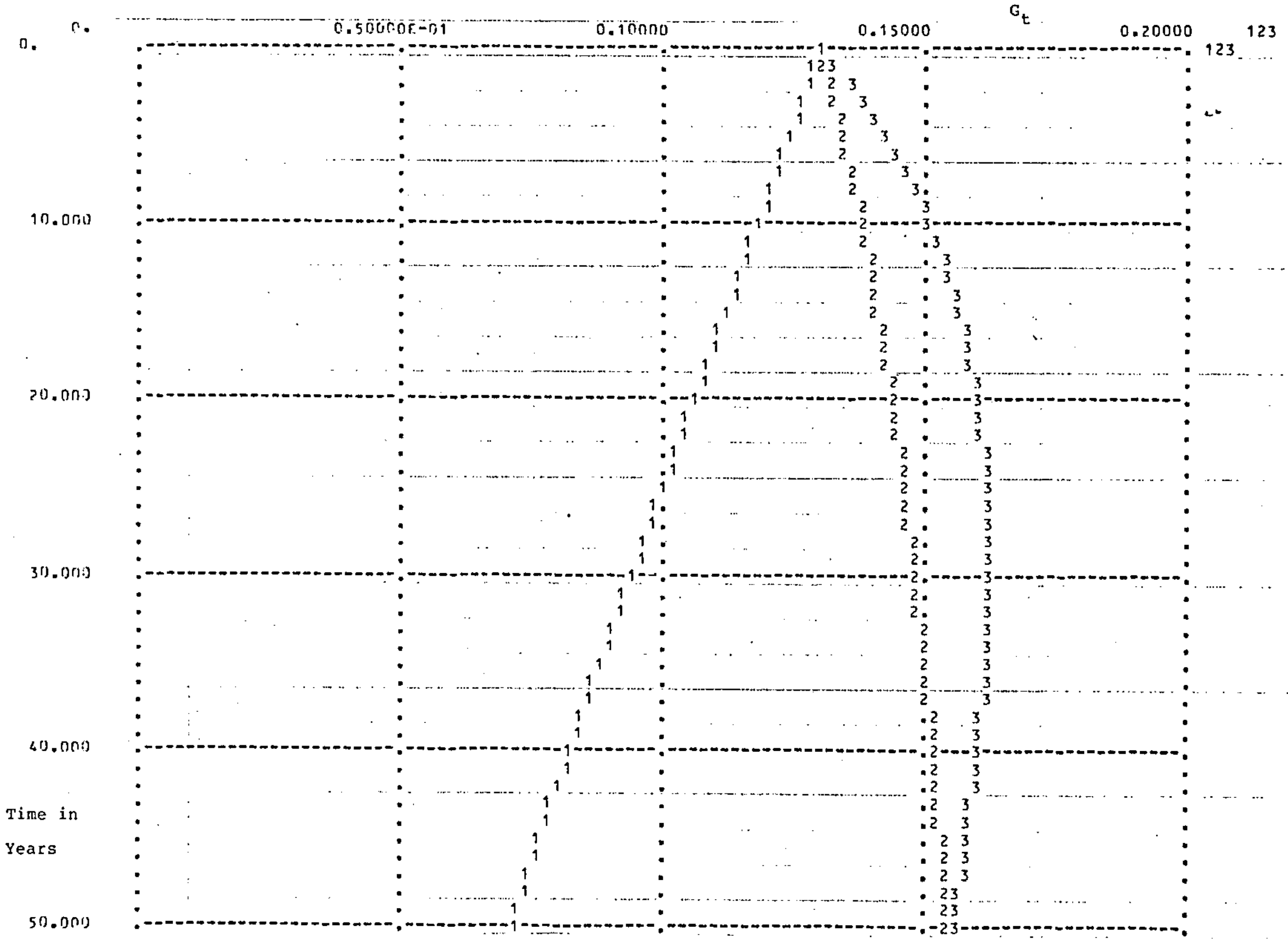

Figure 12 Paths of G_t for Three Alternative Policies: Case 25 ($n = 0.02$, $u_o = 0.1$, $s = 0.05$)

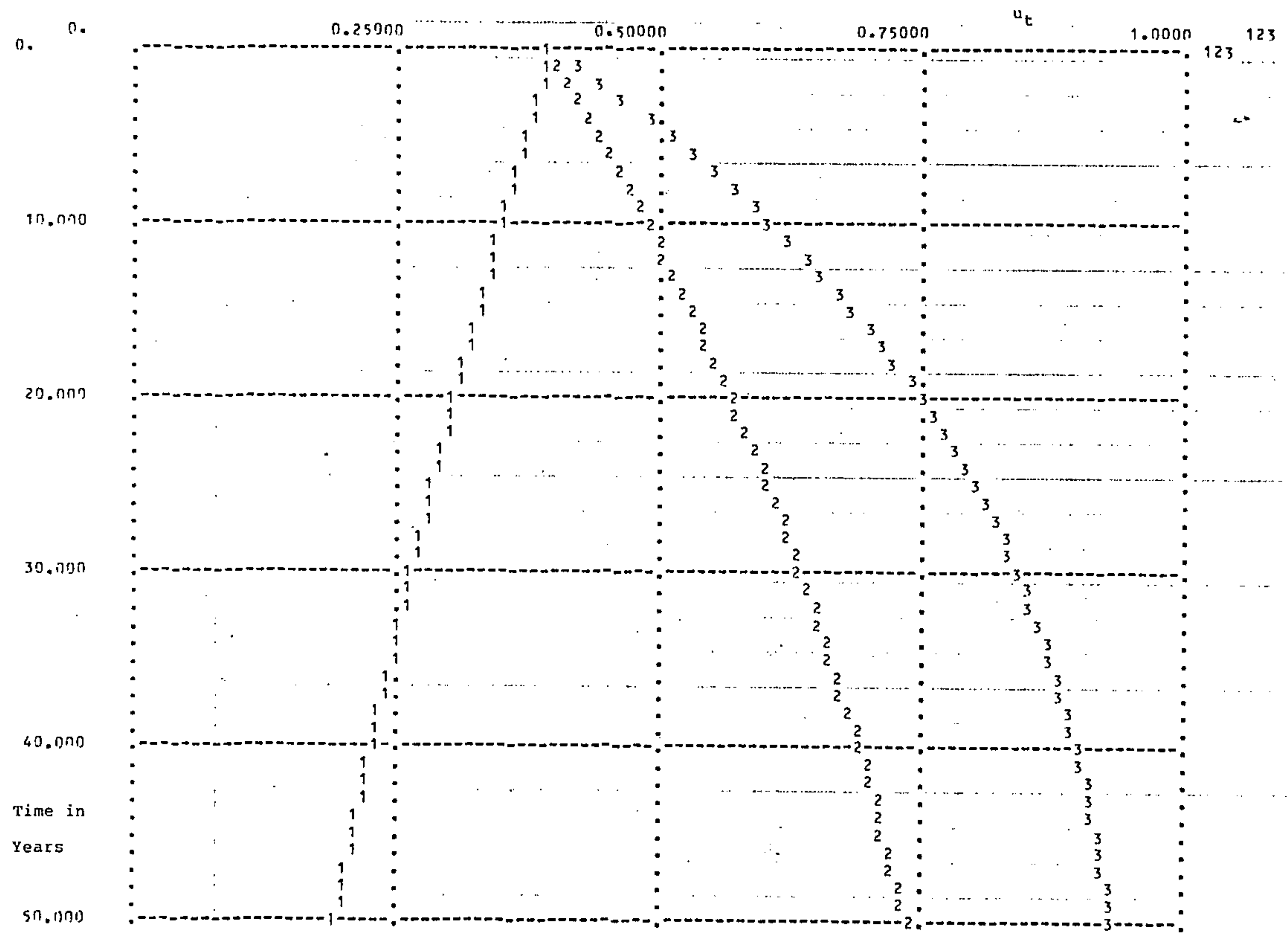

Figure 13 Paths of u_t for Three Alternative Policies: Case 36 ($n = 0.02$, $u_o = 0.4$, $s = 0.2$)

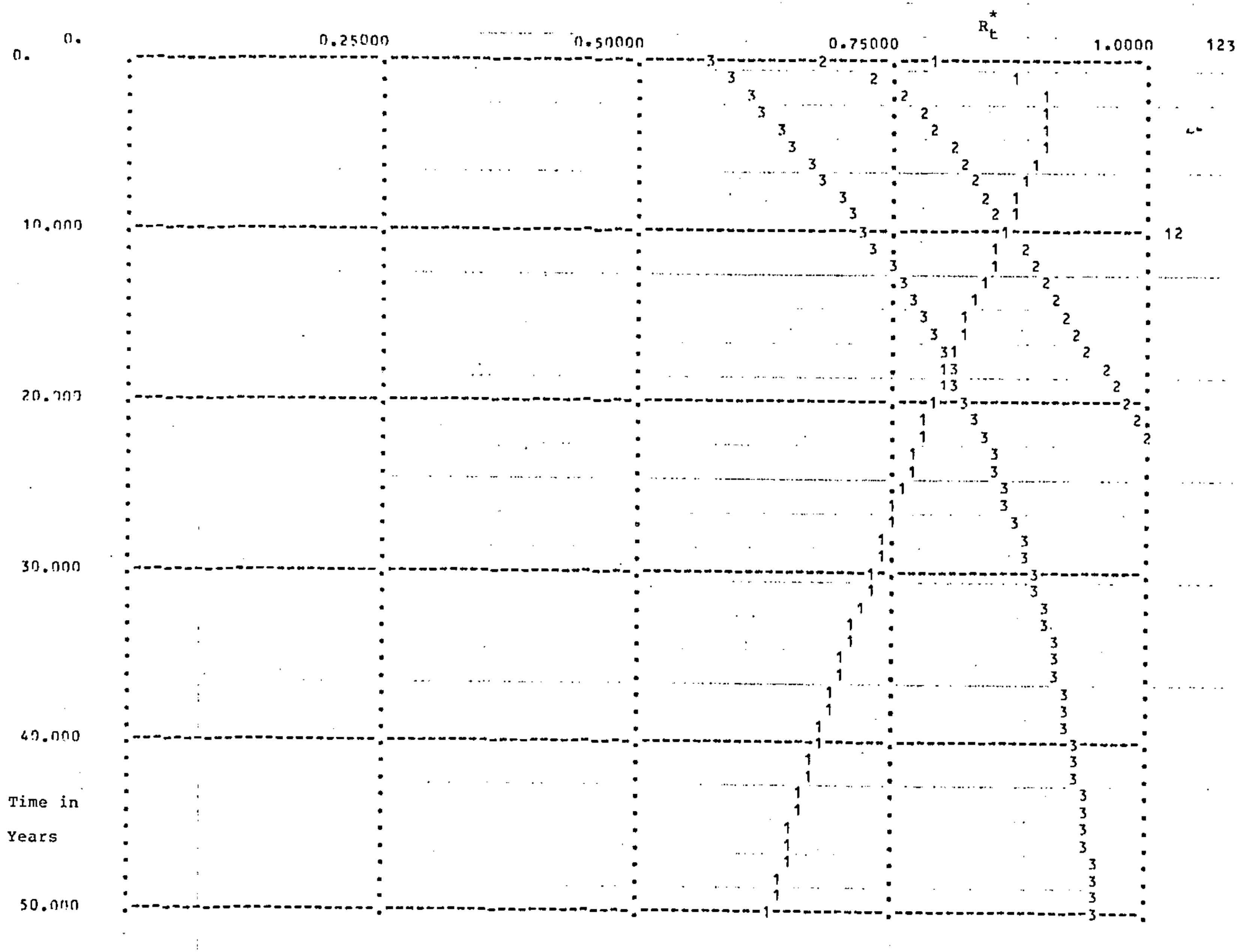

Figure 14 Paths of R_t^* for Three Alternative Policies: Case 36 ($n = 0.02$, $u_o = 0.4$, $s = 0.2$)

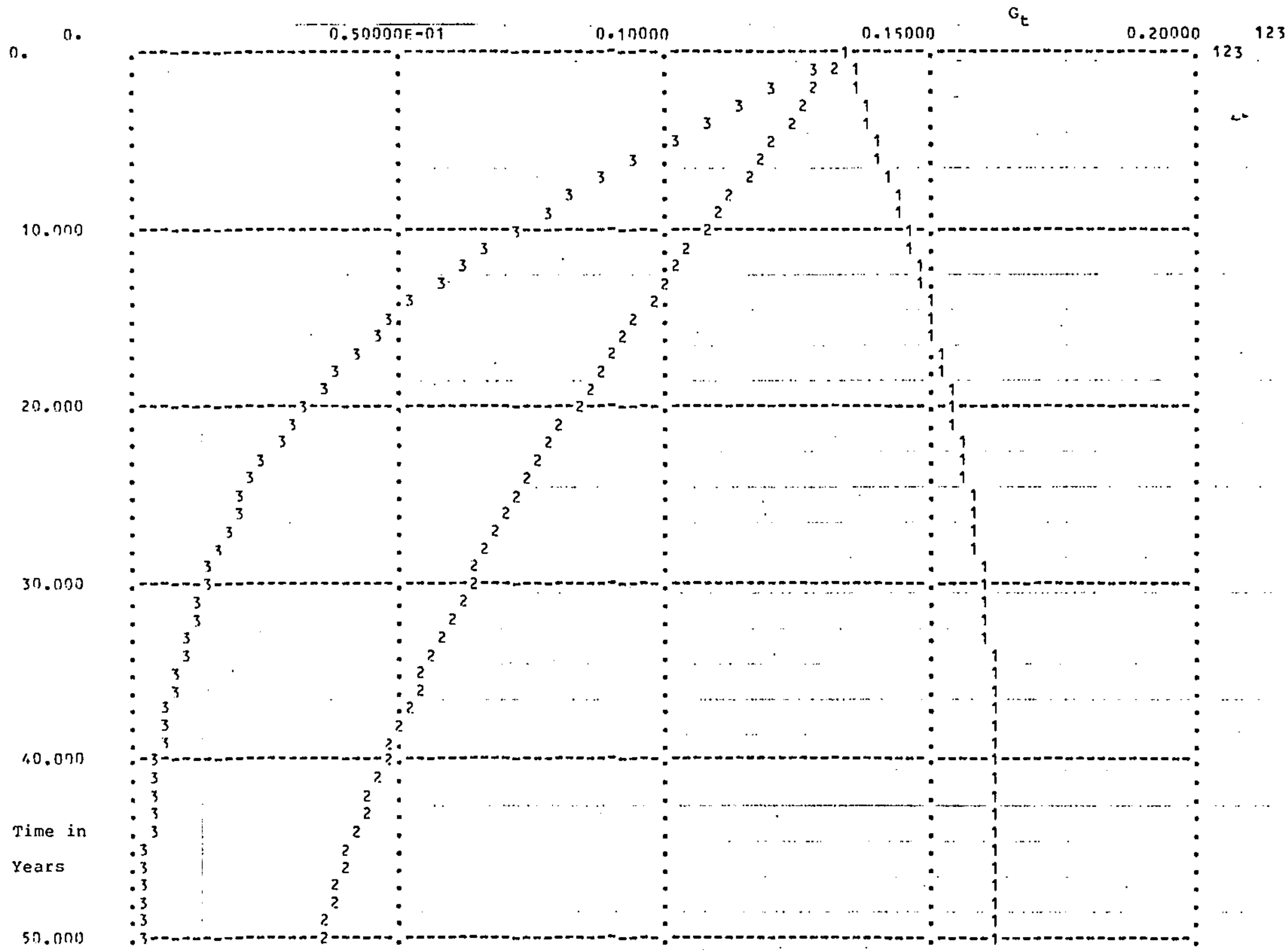

Figure 15 Paths of G_t for Three Alternative Policies: Case 36 ($n = 0.02$, $u_o = 0.4$, $s = 0.2$)