

GROWTH CENTERS AND THE SPATIAL DISTRIBUTION OF DEVELOPMENT FUNDS: THE CASE OF WEST VIRGINIA

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Introduction

In 1964 a growth center strategy was developed for aid to Appalachia (Appalachian Regional Development Act of 1965). The President's Appalachian Regional Commission (ARC) recommended that expenditures be concentrated in state-designated growth areas [16]. The rationale for selecting only growth areas for aid is to avoid funding areas with little or no potential for future self-sustaining economic development. The growth center approach to regional development is in contrast to a "worst-first" strategy which characterized some of the Economic Development Administration's regional funding. However, the worst-first approach has failed to yield encouraging results. Indeed, the evidence suggests that development policy which focuses aid in areas other than those that exhibit the greatest potential either does not work, or the benefits from the investments are not realized for an extraordinarily long period of time [12]. In either case, a worst-first type of investment strategy will be economically inefficient and politically short-lived.

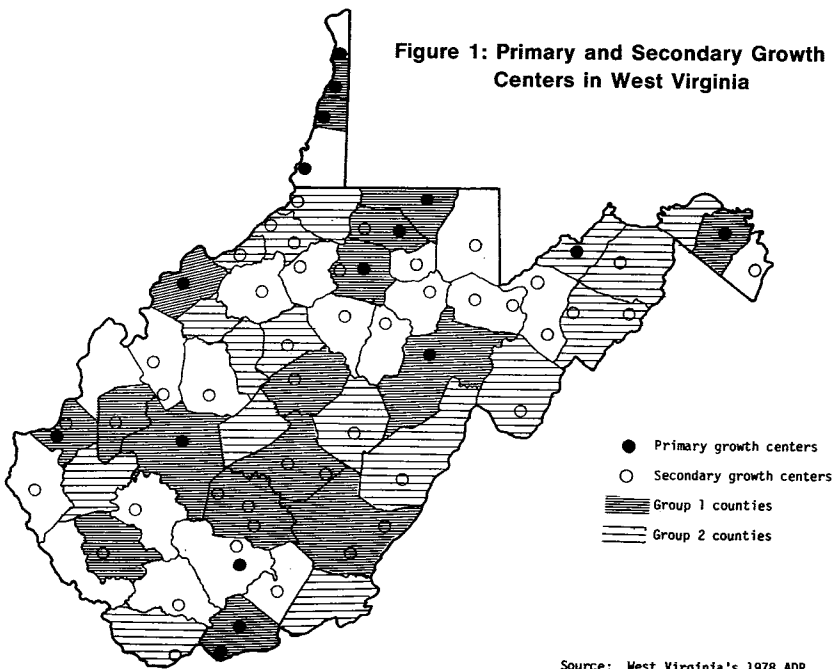
ARC funding was initially concentrated in the Appalachian Development Highway System (ADHS). But as the system expanded, funding was directed to other forms of economic and social overhead capital such as education, health and child development, resource and environmental projects, and housing [3]. Investments in economic and social overhead capital are intended to make the region more attractive for private investment. "As the region obtains the needed physical and transportation facilities and develops its human resources, the Congress expects that the region will then be able to support itself, through the working of a strengthened free enterprise economy" [2, section 2].

Although there have been fifteen years of ARC funding for the Appalachian region, there has been surprisingly little investigation into the effectiveness of ARC investment.¹ This paper investigates crucial aspects of planned development in West Virginia. First, the West Virginia Appalachian Development Plan is discussed briefly along with the posture taken by state economic and community development officials. Second, the spatial distribution of ARC funds throughout the state is examined using the Gini index of concentration. Third, some statistical tests are considered as a preliminary investigation into the consequences of West Virginia development policy. These tests involve the examination of the relative growth patterns of selected counties in West Virginia. Lastly, conclusions and observations concerning planned development in West Virginia, along with some limitations of the analysis, are discussed.

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¹ There have been two attempts to examine the attractiveness of ARC expenditure for the location of new establishments. Fuller [7] reported favorable results although his study was limited to just a few areas. E.S. Preston Associates [6] examined firm location in the proximity of the Appalachian Development Highway System, but no attempt was made to directly link ARC expenditures with the location decisions of new establishments.

Figure 1: Primary and Secondary Growth Centers in West Virginia



Source: West Virginia's 1978 ADP

The West Virginia Appalachian Development Plan

The 1978 Plan. Every Appalachian state eligible for ARC funding must submit a Statewide Development Plan (ADP) to the Commission. The plan contains a comprehensive discussion of the state's development strategy for the upcoming year. It also outlines the criteria for the designation of growth centers within the state. In 1978 West Virginia designated 16 primary and 46 secondary growth centers (Figure 1). The growth centers were selected based on the following criteria: 1) attractiveness for development, 2) responsive government, 3) total community infrastructure, 4) basic community development, 5) responsiveness to development, 6) availability of land, 7) non-quantifiable factors, 8) ability to pay, 9) cost effectiveness, and 10) sustained growth [8, p. 183]. The designation of growth centers is a recognition of the importance of the efficient *spatial* allocation of funds. However, the desire to meet the special needs of severely depressed areas of West Virginia is also a strong consideration in the funding decision. The West Virginia plan states that "... areas with the highest potential for growth will be given special consideration ...;" however, "... projects that are funded, regardless of their locations in or out of the designated growth areas will be implemented with the hope of improving and maintaining a more suitable way of life for all residents throughout the State" [8, p. 196], (emphasis added). Funding projects outside the designated growth areas may tend to equalize the distribution of funds rather than concentrate them as a growth center policy dictates. In fact, in the case of West Virginia, realizing a more equitable distribution of ARC funds within a growth center strategy has been accomplished by simply designating a large number of communities as primary and secondary growth areas.

The 1979 Plan. Unlike the 1978 ADP, which designated primary and secondary centers, West Virginia's 1979 ADP has allowed for regional, primary, secondary,

and rural centers along with areas of "special development opportunities" [8, pp. 189-98]. The centers are chosen on certain minimum requirements based on population, economic base, commercial base, public facilities and service, and accessibility. The ten regional centers provide specialized services and employment opportunities for a large multi-county or interstate area. The growth area of a regional center extends approximately 45 minutes driving time from its central business district. The nine primary centers provide major employment and service opportunities and the growth area extends 30 minutes from its CBD. The twenty-one secondary centers provide more limited employment opportunities and/or basic services for the surrounding population while the growth area extends 15 minutes from its CBD.

The decrease in the total number of designated growth centers from 62 in 1978 to 40 in 1979 may be considered a more conservative approach to the spatial allocation of funds. Yet it is not clear whether the total area served by ARC funds decreased. Although projects outside designated growth areas must provide critically needed services, the 1979 plan suggests that any community outside of a growth center could be identified as a rural service center [8, p. 198]. Also, a community outside the designated growth areas need not be identified as a rural service center to be considered for funding. Any community which exhibits "unique growth potential" may receive funding for "special development opportunities." The designation of a large number of growth centers along with the provision of funds to communities outside the growth areas highlights the conflict between the desires for the efficient allocation of funds through a growth center strategy and for the meeting of special needs of depressed communities located outside the state's growing areas. This conflict is especially acute in West Virginia because many communities lack basic health and educational facilities.

The Distribution of ARC Funds

Has West Virginia adopted a growth center approach for distributing ARC development funds? The question can be answered by examining a simple measure of concentration — the Gini coefficient. Values of this measure of inequality range from 0, perfect equality, to 1, perfect inequality. To calculate this coefficient, counties in West Virginia are ranked in increasing order by ARC non-highway funds received up to 1977.² The cumulative percentage of West Virginia's population is then calculated as we move up the funding distribution by county, from the lowest funded county to the highest. If ARC expenditures were distributed equally on a per capita basis then the Gini will equal zero. However, if West Virginia has developed a conservative growth center strategy, concentrating funds in relatively few growth areas, then we should expect the Gini index to be close to one. The value for West Virginia, however, is .11. This implies a very equal distribution of non-highway ARC expenditures up to 1977. Again, the equitable distribution of ARC expenditure demonstrates the conflict between the funding agency's desire for an efficient allocation of limited funds and the state and local planning agencies' incentive to increase the distribution of benefits resulting from federal aid. Although the Commission's intent to concentrate funds in a limited number of growth areas is clear, there is no provision which allows ARC to scrutinize the state's selection of growth centers.

² Ranking with respect to ARC non-highway funds was determined from *ARC Projects by State and Development District*. This is unpublished data obtained from the Appalachian Regional Commission, Washington, D.C.

Examining the Performance of Growth Areas

In order to examine some of the consequences of West Virginia's development policy, an investigation into the growth patterns of selected counties is undertaken. The method of analysis is to choose two groups of counties — one group which might be expected to exhibit relatively high rates of growth and one group which might be expected to demonstrate relatively poor rates of economic development. The *relative* growth patterns of these two groups are then compared. Although ARC funds have been distributed in a relatively equitable fashion, it is possible to identify these two groups based on the absolute amount of ARC expenditure and the existence of major transportation facilities. An adequate transportation network is considered to be one of the prerequisites for Appalachian development [16] and therefore is one of the criteria which define the two groups.

All counties in West Virginia are categorized in terms of ARC non-highway funding and the existence of a major highway within the county. The two groups of counties that are examined represent the extremes of these two categories. Group 1 counties have a major highway and are ranked within the upper one-half with respect to non-highway funding. Group 2 counties do not have a major highway and are ranked within the lower one-half in terms of non-highway funding. Each group contains 17 counties. The remaining 21 counties are not

Figure 2: Hypothesized Performance of Group 1 and Group 2 Counties

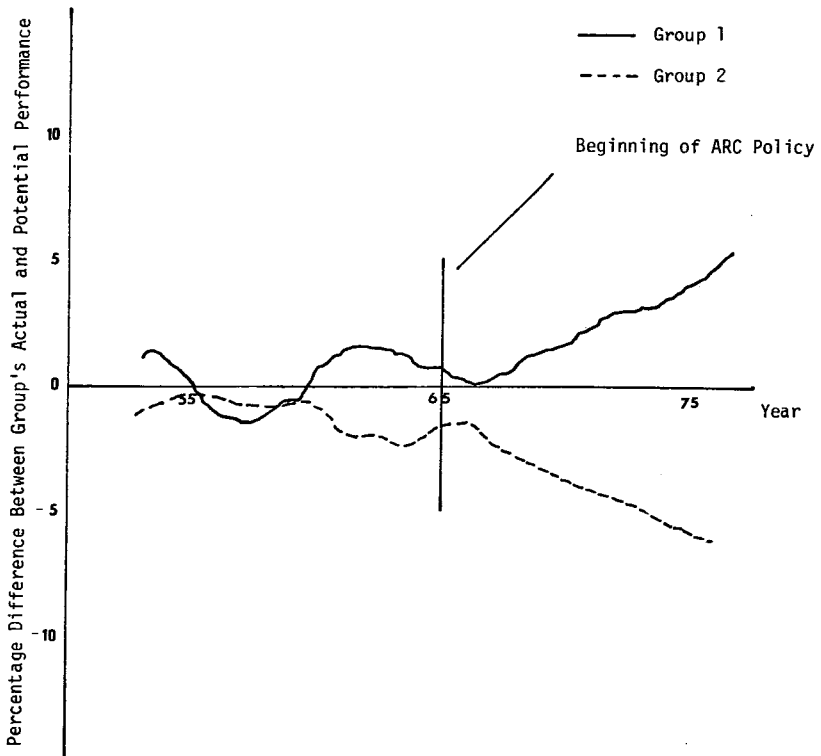
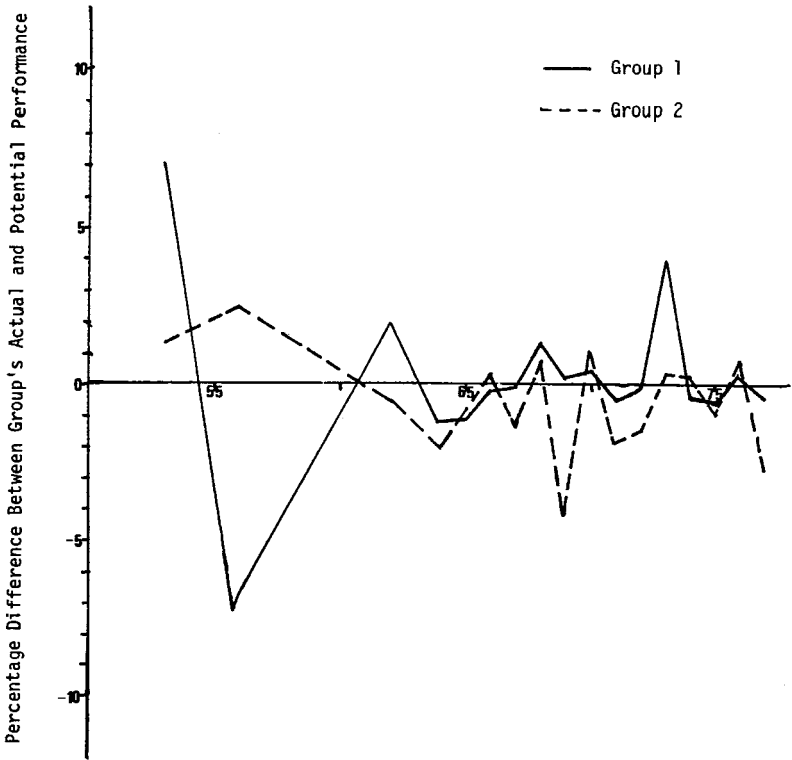


Figure 3: Number of Establishments



considered since they are either ranked in the upper half in terms of funds but do not have a highway, or were ranked in the lower half and do have a highway. Groups 1 and 2 are the groups with which the analysis is concerned. The hypothesis is that Group 1 counties, because of their relative advantage in funding and transportation facilities, should perform better with respect to certain economic variables. Twelve of the sixteen primary growth centers are located within Group 1 (see Figure 1). Group 1 counties received approximately nine times more non-highway ARC funding than Group 2, and virtually all the major urban areas in West Virginia are located in Group 1. Also, 1974 per capita income for Group 1 was estimated to be \$3,690 while Group 2 per capita income was \$2,872 [18]. The comparison of Groups 1 and 2 is based on three performance variables: 1) number of establishments, 2) number of employees and 3) taxable payroll per employee. [19]. Utilizing per capita income and net private investment expenditures would have been ideal, but these data are not available.

Potential Growth. The approach taken here is similar to the one taken by Moore and Rhodes [13] in their evaluation of British regional development policy. Their paper utilizes disaggregated industry employment (difficult to obtain in the present study because of disclosure problems) which amounts to a type of shift-share analysis. Actual growth in the performance variables is measured against each group's "potential" growth. Group potential is defined as the number which would have been observed had the group realized the state's

growth rate in that particular variable. For example, the number of establishments located in Group 1 counties in 1976 and 1977 was 20,233 and 21,170 respectively. The state's growth rate in number of establishments between years was 4.2 percent. Group 1's potential for 1977 therefore would be 1,042 (20,233) = 21,082. The percentage between the group's actual and potential figures is calculated by (actual-potential)/actual and is given in Figures 4 to 6. Figure 3 is an example of a hypothetical case where group performance is as expected. That is, Figure 2 shows Group 1 counties performing as true growth areas. If this were the case, we would expect Group 1 to be increasingly moving away from its potential sometime after the implementation of ARC policy. However, this is not to say that Group 2 counties are not expected to grow — the hypothesis simply states that we expect Group 1 counties to perform better than those areas which have been considered to have relatively lower growth potential.

Empirical Results

Based on the evidence presented in Figures 3-5, there is little support for the hypothesized group performance. To test whether there are any significant time trends in each groups performance, simple Pearson product-moment coefficients were calculated between each group's performance and time. Table 1 shows the only significant trends are the performance in each group's taxable

Figure 4: Taxable Payroll Per Employee

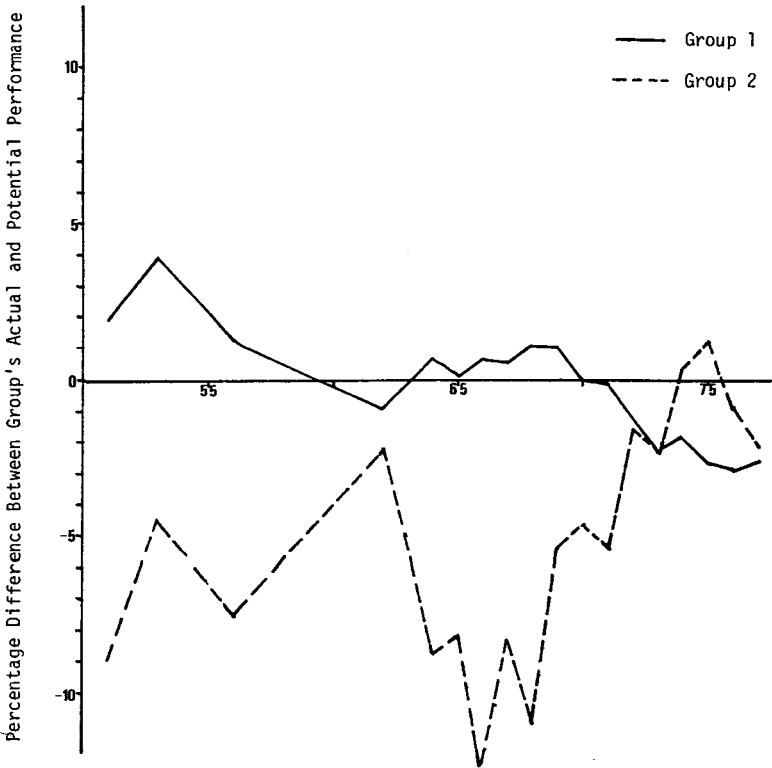
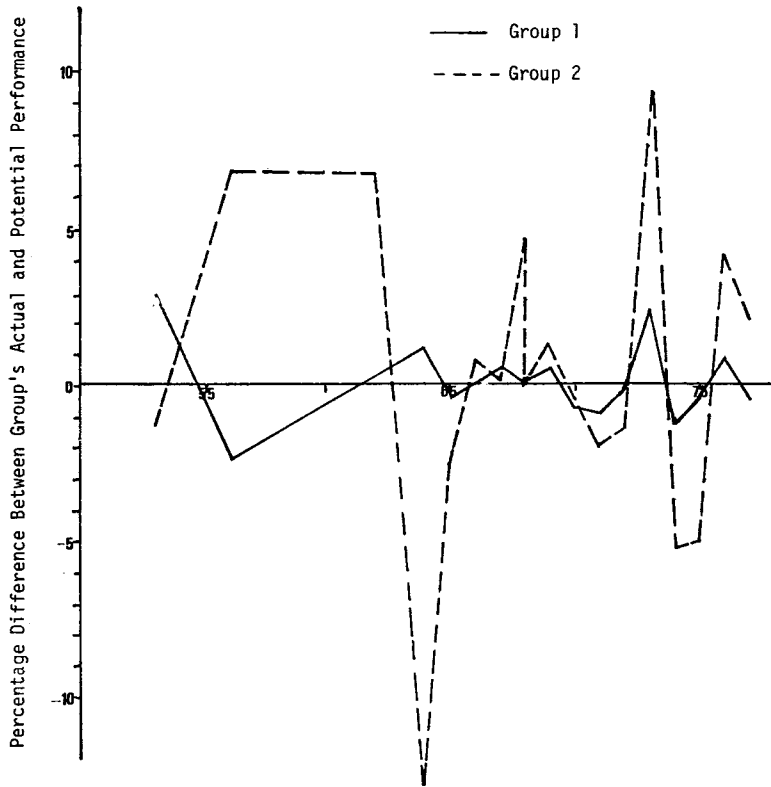


Figure 5: Non-Mining Employment



payroll per employee. However, the trends are the opposite of what is anticipated.³ That is, the overall trends in taxable payroll for Group 2 has been consistently to exceed its potential while Group 1 shows relatively poor performance with respect to its potential. To the extent that taxable payroll may be considered a proxy for per capita income it seems the trend in West Virginia has been to equalize the rates of economic development throughout the state. These results may in part reflect the equitable per capita distribution of ARC expenditure and West Virginia's attempt to place funds in areas greatly in need of government assistance. Group 1's performance, however, did show significant improvement between 1964 and 1969. Since this period was one of relative national prosperity, it may show that Group 1 counties, generally the more diversified industrial group, are more responsive to national economic performance than the relatively less-developed counties.

The two remaining variables, number of establishments and non-mining employment, show no clear pattern (Figures 3 and 5). However, the general perform-

³ Since Group 1 is the "dominant" group in terms of its share of the state's total employment and establishments, one should not expect drastic deviations from its potential. In fact, this is shown by the average standard deviation for Group 1 variables, 2.1, as compared to 4.1 for Group 2. However, recognizing the relationship does not alter our conclusions.

Table 1: Correlation Coefficients Between Group Performance and Time After Implementation of ARC Policy, 1967-77.

	Group 1	Group 2
Establishments	-.12	.01
Payroll	-.96*	.81*
Non-mining Employment	.06	-.10

* Significant at the .01 level.

ance of Group 2 counties exhibits a much wider variation than that of Group 1. This may be caused by the linkage between county and state performance. That is, Group 1 counties may be closely linked with the performance of the state while Group 2 counties exhibit more independent variation. This relationship was tested by calculating correlations between state growth rates and group performance. Table 2 shows that the variation in Group 2 performances is not highly correlated with state growth with the exception of payroll. Group 1 counties do show a relatively strong relationship with state growth rates. This conclusion should be made cautiously because Group 1 counties constitute a significant proportion of state activity and therefore may be expected to have a strong positive relationship with the economic performance of the state.

Table 2: Correlation Coefficients Between Group Performance and State Growth Rates After Implementation of ARC Policy, 1965-77.

	Group 1	Group 2
Establishments	.75**	-.06
Payroll	-.42	.59
Non-mining Employment	.58*	.45

** Significant at the .05 level.

* Significant at the .10 level.

Conclusions and Observations

Why hasn't the expected economic performance in these two groups been realized? There are four possible explanations: 1) time lags between public investment and private industrial location, 2) limitations in the variables which were chosen as measures of performance, 3) choices of growth centers and West Virginia's attitude toward growth center strategy, and 4) the lack of a comprehensive development policy.

Even if public investment in social overhead capital and economic overhead capital does attract private investment, the effect of such investment will not be realized for long periods of time.⁴ Therefore, in any analysis of such indirect methods to lure private investment, one might expect "... decades will have to elapse before it is feasible to measure the total impact of investments in public works." [11]. This is especially true in West Virginia and other depressed Ap-

⁴ For an alternative view of the attractiveness of public expenditure for private investment see Hansen [9]

palachian states. One of the causes of persistent high levels of unemployment in Appalachia is the structural disadvantage of the region in terms of transportation facilities and other types of overhead capital. Developing a region through structural investment is an indirect strategy since no direct inducements for new capital formation is taken. In fact, there is relatively little evidence that new firm location within Appalachia is a result of ARC investment [6 and 7]. Therefore, recognizing the indirect character of ARC inducement, one must be cautious when evaluating this type of policy prematurely [17].

The variables used in this study are not ideal. Data on private investment by county would be a better indicator of new industrial activity than the "number of establishments" variable. Per capita income would also have been a useful variable, but these data are not available on an annual basis. Disaggregated employment data would have been valuable in identifying the growth performance of individual industries, but disclosure problems preclude their use.

Development planning in West Virginia has not adopted a conservative growth center approach — ARC funds have not been concentrated on a per capita basis. In part, this is a result of the state and local planning councils' attempt to maximize the distribution of benefits flowing from ARC funding. Also, guidelines for the designation of growth centers were never specified by the Commission. It is not surprising, therefore, that a large number of growth centers have been designated. Indeed, there is a great deal of controversy in the economic literature over what constitutes a growth center and how these centers should be spatially dispersed [5, 15, 14, and 4]. However, the equitable distribution of funds may serve to weaken the impact of ARC funding on the economic development of the state. The greater the number of centers selected, the weaker the impact, because only a limited number of industries is in search of a location and because the financial assistance that can be given to any state project is in inverse proportion to the number of centers selected [10].

The first objective of ARC was to make the Appalachian region more accessible to the more prosperous, surrounding regions. The ADHS was developed to accomplish this goal. Next, ARC funding focused on investment in human capital and EOC. But can investment strictly in infrastructure be expected to attract private investment? The answer may be "yes," yet a more comprehensive approach to development policy, one which includes direct inducements for new plant location, would be more effective. An effective regional development strategy might combine capital and labor subsidies. The combination of capital and wage subsidy may be a far stronger inducement to firms to locate expansion facilities in depressed regions than investment in social overhead capital [12]. This does not chide ARC investment strategy because, clearly, an adequate infrastructure is a prerequisite for new firm location. It does point out, however, that ARC inducement for new firm location is an indirect one and that more direct methods should be considered in future development of ARC policy.

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