

MULTINATIONAL INVESTMENT, INDUSTRY RISK, AND POLICY COMPETITION

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Abstract:

In an uncertain business climate, multinational enterprises must take account of future exit costs in deciding where to locate a branch plant. We study how differences in national labour-market conditions between countries influence this decision. Other things equal, the most attractive location has a flexible labour market (low closure costs) together with a low opportunity cost of employment (high unemployment). In a game between two countries, a nation with an inflexible labour market and high unemployment will succeed in attracting low-risk firms, while that with more flexible labour markets and low unemployment will win the game for higher risk firms.

JEL Codes: D92, F12, F23

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1. INTRODUCTION

Virtually every industrialised country looks to attract foreign direct investment (FDI) by multinational enterprises (MNEs), through offers of various types of economic inducements. In these attempts they are frequently in competition with other putative hosts, who are also prepared to offer a range of incentives to the firm. The country that wins the investment is that which presents the best package of incentives together with local economic conditions. While some countries are generally more successful than others in attracting MNEs, perhaps reflecting relatively more advantageous underlying conditions, not all foreign investment is drawn to these locations. This may be because the advantages that a country may offer firms in a particular industry may not be as appealing to a firm operating in another part of the economy.

We wish to investigate the international competition for MNE FDI and attempt an explanation for the pattern of investment. Our goal is to determine whether some locations offer *industry-specific* advantages, allowing these countries to win the competition for particular firms, while they lose the battle for other industrial investment. The investment environment, tax regimes, and labour market conditions are obvious areas that firms have to consider in assessing alternative production locations, while countries may actively encourage establishment through the use of various investment or tax incentives.

Theoretical as well as empirical research indicates that MNEs take several elements into account when deciding where to establish production plants. Furthermore, when several countries try to attract the same investments, the result may well be a policy competition between the countries. In Haaland and Wooton (1999) we studied such policy competition between symmetric countries in a setting where there were agglomeration effects initiated by the inward FDI, implying that the country that succeeded in attracting the investments could gain from industry-level scale externalities. However, depending on the exact conditions in

the market, the necessary subsidies to attract the firms could, due to the policy competition, be such that the successful host country ended up with no net benefits.

In that paper, as well as in similar studies, the framework was static and deterministic, and the policy competition took place along one dimension only, investment subsidies. In Haaland and Wooton (2001), we demonstrate how entry decisions may depend on more than merely these investment incentives. In particular, we take into account the fact that firms may have to close down production in the future, and that they consequently must consider the exit costs and conditions as part of their entry decision. We consider a form of labour-market flexibility measured by the government-mandated redundancy payments that a firm faces on closure of its branch plant. The paper demonstrates a trade-off between investment incentives and labour-market flexibility, in that a country with a more flexible labour market finds it easier to attract FDI than one with more severe redundancy rules.

In the present paper, we follow up and extend our analysis. We previously assumed that the benefit to the host country of the FDI could be captured by the present value of the workers' income. But this implicitly assumes that, in the absence of the MNE, these workers would be unemployed, in stark contrast to the situation in a country with a tight labour market. In that situation, there is already a high level of employment and the benefit of the MNE job will be the difference between the earnings in the MNE and the alternative wage that could be made in another sector of the economy. We consequently allow an additional asymmetry between potential host countries in terms of the opportunity cost of MNE employment. This shall be high in countries with relatively full employment and low when there is a lot of unemployment.

We therefore have two dimensions to the underlying conditions of the host countries' economies: labour-market flexibility and the employment level, which we shall model using redundancy payments and the opportunity cost of employment, respectively. We want to

determine which configurations of these will make a potential host more successful in attracting FDI from MNEs in any particular industry. We might argue, for example, that the investment conditions within Europe differ widely, despite the single market. Take, for example, two stylised European countries that we shall label “Germany” and “the UK”. Suppose that, among other things, the former has relatively high unemployment but strong measures in place to protect those who are employed, while the latter protects employees less but enjoys a higher level of employment. How might these differences affect the respective governments’ enthusiasm for FDI by an MNE, and what impact do they have on the relative attractiveness of the locations for the MNE itself? Is Germany better able to attract FDI in some industries while the UK wins the competition for other types of firm?

In Section 2, we set out the model of multinational investment that we used in Haaland and Wooton (2001). We then consider the MNE’s investment decision; the incentives facing national governments, and the policies necessary to attract the MNE. Section 3 considers policy competition between rival locations. Section 4 discusses different levels of risks amongst MNEs and looks at the interaction between risk and demand, while Section 5 concludes.

2. A MODEL OF MNE INVESTMENT

An MNE decides on the location of its investment in an integrated economic region comprising several countries and without intra-regional barriers to trade (tariffs or transport costs). Wherever it produces, the firm will face the same demand schedule for its good. The inverse demand curve is:

$$p = a - bx \tag{1}$$

where x is the output level of the branch plant of the MNE, p is the price, and a and b are constants. We shall examine, later in the paper, an alternative specification for demand that incorporates industry risk.

Production is characterized by increasing returns to scale. Consequently, the firm will choose to locate its production facilities in a single plant, from which it will serve the entire region. While the technology is the same irrespective of where production takes place, costs will depend on the location chosen by the firm. In each period of production, the firm must pay a fixed cost F and constant marginal cost, such that total costs are:

$$c = F + w\beta x \quad (2)$$

where β is the unit labour requirement and w is the wage rate offered by the firm. Total employment by the firm amounts to:

$$L = \beta x \quad (3)$$

The firm is exposed to an uncertain business climate and we assume that it faces an industry-specific risk with probability ρ of a catastrophic shock. Should the firm be obliged to close down its factory, it will encounter closure costs, having to pay government-mandated severance pay and making some repayment to the national government of any initial investment subsidy.

2.1 The firm's decisions

The MNE will choose to establish production facilities in a host country only if the benefits of doing so exceed those it would achieve in the next-best location.¹ Let r be the severance pay that the firm is required to give to each laid-off worker when the plant is closed. We assume that the firm discounts the future at rate $\delta \leq 1$.

¹ Where necessary we shall use subscripts to distinguish between locations.

In deciding upon the optimal level of production (and employment) the firm will maximize the expected present value of its *net* operating profits, that is, the expected present value of profits less the expected present value of the costs of closure. Solving for this yields expected present value (see Haaland and Wooton, 2001):

$$\Omega = \frac{(1-\rho)}{4b[1-\delta(1-\rho)]} \left\{ [a - \beta(w + \delta\rho r)]^2 - 4bF \right\} \quad (4)$$

where the equilibrium quantity, employment, and profits for the firm in the location are:

$$x = \frac{a - \beta(w + \delta\rho r)}{2b}$$

$$L = \beta \frac{a - \beta(w + \delta\rho r)}{2b}$$

$$\pi = \frac{(a - \beta w)^2 - (\beta\delta\rho r)^2}{4b} - F$$

The government of the host country offers an investment subsidy, S . This is given to firms that operate for at least the first period.² Consequently, the present value of the subsidy to the firm is $(1-\rho)S$.

In choosing whether or not to establish its production facilities in a country, the firm considers both the expected present value of its net operating profits and any extra costs of establishment and closure. The overall return R to the MNE of establishing its branch plant is the sum of the expected present value of its operating profits, Ω , and the net benefit of the subsidy. Thus:

$$R = (1-\rho) \frac{[a - \beta(w + \delta\rho r)]^2 - 4bF}{4b[1-\delta(1-\rho)]} + (1-\rho)S \quad (5)$$

² In Haaland and Wooton (2001) we consider the implications of repaying (some or all of) the subsidy should they shut down production. As this additional complexity does not qualitatively affect the results of this paper, we do not introduce it here.

The MNE will compare different locations and choose to invest in the country that offers it the highest return. We assume that the governments shall compete to attract the firm by offering different combinations of investment subsidies and labour market environments. Consequently, a more convenient way of expressing (5) is to write it in terms of S^R , the minimum subsidy necessary to give the MNE an overall return of R :

$$S^R = \frac{R}{1-\rho} - \frac{[a - \beta(w + \delta\rho r)]^2 - 4bF}{4b[1 - \delta(1-\rho)]} \quad (6)$$

2.2 FDI and the host country

In order to attract the MNE, the putative host can offer inducements to the firm. At the same time, domestic employment legislation will influence the investment decision. We have considered many of these issues at length in Haaland and Wooton (2001). Therefore, we jump directly to considering the benefits of MNE investment to the host country.

We assume that the workers employed by the MNE have an opportunity cost v . Thus, the benefit of MNE employment will be the difference between present value of the return to MNE employment (the wage and the redundancy payment) and this opportunity cost, less the present value of the subsidy paid out by the host government. Let Γ be the present value of employment by the MNE:

$$\Gamma = \frac{\beta(1-\rho)(w-v+\delta\rho r)[a-\beta(w+\delta\rho r)]}{2b[1-\delta(1-\rho)]} \quad (7)$$

where we assume that the government's discount rate, δ , is the same as that of the MNE.

As the cost of the subsidy to the government is identical to the gain perceived by the firm, the overall benefit, B , to the host country of the MNE's investment is Γ less the cost of the subsidy. Thus:

$$B = (1 - \rho) \frac{\beta(w - v + \delta\rho r)[a - \beta(w + \delta\rho r)]}{2b[1 - \delta(1 - \rho)]} - (1 - \rho)S \quad (8)$$

Once again, it is more convenient to express this relationship in an alternative fashion. Let S^B be the maximum subsidy that the government can offer the MNE and still achieve an overall benefit of B from the investment.

$$S^B = \frac{\beta(w - v + \delta\rho r)[a - \beta(w + \delta\rho r)]}{2b[1 - \delta(1 - \rho)]} - \frac{B}{1 - \rho} \quad (9)$$

2.3 *Attracting, and the attraction of, MNE investment*

We assume that the MNE will invest in the location that yields the highest overall return. Let R be the minimum level acceptable, at lower levels the MNE will choose to keep its production at home. Similarly, the host government has alternative uses for its resources and will not encourage MNE investment unless it can expect an overall benefit of B . We define $X \equiv S^B - S^R$ to be the excess subsidy. Subtracting (6) from (9) yields:

$$X = \frac{[a - \beta(w + \delta\rho r)][a + \beta(w - 2v + \delta\rho r)] - 4bF}{4b[1 - \delta(1 - \rho)]} - \frac{B + R}{1 - \rho} \quad (10)$$

Differentiating (10) with respect to r yields:

$$\frac{\partial X}{\partial r} = -\frac{\beta^2 \delta \rho (w - v + \delta\rho r)}{2b[1 - \delta(1 - \rho)]} < 0$$

Thus a country with lower redundancy payments is better able to afford the subsidy necessary to attract the MNE. We shall designate an investment opportunity where $X \geq 0$ as “feasible”.

Figure 1 examines the interplay between redundancy payments r , the opportunity cost of MNE employment v , and the risk associated with the industry ρ .³ Let $B = 0$ and $R = 0$.

³ The parameter values used for this simulation are: $a = 10$, $b = 1.25$, $F = 15$, $w = 1$, $\beta = 1$, and $\delta = 0.9$.

We illustrate the X schedules for four combinations of redundancy payments and opportunity costs. The host government gains more from the investment of the MNE when v is low and r is high, hence it would be prepared to offer a higher subsidy in these circumstances. However, the negative impact on the MNE of increased redundancy payments is greater than the additional benefits accruing to the host government and therefore X is decreasing in r .

Redundancy payments are irrelevant in a world of certainty, with no fear of plant closure. Thus, for low values of ρ , the excess subsidy will be greater in countries with low opportunity cost of MNE employment, regardless of their mandated redundancy payments. As industry risk increases, the role of redundancy payments grows in significance.

In order to better understand how X depends on the parameters, Figure 2 shows the S^B and S^R loci separately for various values of r and v . S^B is a decreasing function of ρ while S^R is increasing in ρ . Higher opportunity cost of labour, v , reduces the maximum subsidy offered by the government, but does not affect S^R . An increase in the required redundancy payment, r , on the other hand, shifts both loci upward. However, the required subsidy to attract the investment increases by more than what the government is willing to offer. Hence, $X (= S^B - S^R)$ is a decreasing function of r , as shown in Figure 1. Furthermore, S^B shifts down when the required benefit B increases, while S^R shifts up with R , the required return by the MNE.

3. OPTIMAL POLICY AND POLICY COMPETITION

3.1 *One-country case*

If we consider policies in only one country, there is a basis for MNE establishment as long as the location is feasible (that is, $X \geq 0$), since it means that the subsidy the country is willing to offer exceeds the subsidy required by the firm. When $X > 0$, there is a net expected benefit

from establishing production. How this benefit is split between the MNE and the host country depends on the bargaining power of the firm relative to that of the host country.

3.2 *Competition between several countries*

With two or more potential host countries, the countries can be expected to compete for the investments. A simple policy game could be as follows: first, the countries determine the subsidies they will offer; secondly, the MNEs choose the optimal location for their plants; and, finally, production takes place and profits and benefits are realised as long as the firm is in business. Hence, once a plant is established in a certain location, it will not move again. It may, however, have to close down should the market conditions become unfavourable. We use the subscript i to indicate country-specific characteristics.

It is fairly straightforward to see the solution to this policy game. Since X_i shows how much country i is willing to offer in excess of what the firm requires in that location, country i will win the game if the following conditions hold:

$$\begin{aligned} X_i &\geq 0, \\ X_i &\geq X_j \quad \forall j \end{aligned} \tag{11}$$

The first condition ensures that the investment is feasible; the second that the maximum support that location i can offer exceeds the net benefits in any other location.

Once again there is the question of the division of the benefits between the MNE and host countries and how this alters as a result of there being alternative locations for the FDI. A further issue can be addressed in this multi-country framework. With more than one MNE seeking to invest, would all firms end up in the same host country; or will individual country characteristics induce firms from different industries to locate in different nations?

3.3 *Symmetric countries*

In this case all countries will have the same X and the choice of location becomes arbitrary. Plants will be established in any of the countries as long as X is non-negative. Hence, there will be a threshold level $\bar{\rho}$ such that all MNEs with $\rho \leq \bar{\rho}$ establish production in one of the potential host countries. So far, this is similar to the one-country case. However, in terms of distribution of benefits, the cases differ. In this multi-country case, policy competition results in all net benefits going to the MNE, since each country will increase the subsidy that it offers to the maximum level S^B in its attempt to attract the foreign firms. Consequently the country that wins the competition for the branch plant ends up no better off than the losing countries.

3.4 *Asymmetric countries*

With asymmetric countries the policy game becomes more interesting. In this model the relevant country characteristics are linked to the labour market. The redundancy rate, r , measures the flexibility (or rigidity) of the labour market, while the opportunity cost, v , is a measure of the overall employment conditions. High opportunity cost indicates close to full employment, while a low v shows that the extra employment that the MNE would provide is of great value to the country. The important industry characteristics are the degree of uncertainty and the required return R . However, in a policy competition case, the required R would typically be the return that the best alternative location could offer, so we can focus on ρ as the exogenous parameter characterising the industries.

Figure 1 and equation (11) help us understand the outcome of such a policy competition. Consider a situation with two countries, **A** and **B**. Each country can have a high or low r , and high or low v . A country with low r and low v relative to the other nation will win all foreign investments. Similarly, a country with high r and high v will always lose. This simply says that a country with a flexible labour market and no alternative employment for the labour force is better placed to win a policy competition for MNEs. But what if

country **A** has high r and low v , while country **B** is characterised by low r and high v ? The two loci in the middle of Figure 1 illustrate this case. Country **A** is represented by the $(r = 7, v = 0)$ -locus, and country **B** by the $(r = 0, v = 0.5)$ -locus. For MNEs in industries with $\rho < \rho_A$, country **A** will win, while country **B** offers the better deal for higher risk industries.

In terms of actual subsidies offered, and hence the distribution of the expected net benefits between the MNE and the host country, the optimal choice by the country with the higher X would be to offer a subsidy slightly above the maximum subsidy that the other country can offer. Hence, when $X_A > X_B$, country **A** wins the investment and gets a net benefit of $X_A - X_B - \varepsilon$.

Table 1: Which location wins?		opportunity cost of employment	
		low v	high v
redundancy payment	low r	always	high ρ
	high r	low ρ	never

Table 1 summarises these results. A country with inflexible labour market regulations (high r) is at a disadvantage when it comes to attracting foreign firms. However, if there are few or no alternative employment opportunities in the country (low v), it may still be able to attract foreign investments by offering higher subsidies than other countries.⁴ For industries with a fairly low degree of uncertainty about future market conditions, the higher subsidies outweigh the exit costs firms may incur in the future, should they have to close down their branch plants. In more uncertain industries, the likelihood of plant closure in the future is higher, and the exit costs consequently count for more. For firms in such industries, labour-market flexibility is more important than initial subsidies.

⁴ Remember from Figure 2 that a low v implies a higher level of S^B for any level of ρ .

4. DEMAND AND RISK

So far we have analysed the countries' ability to attract investments, but we have not discussed whether investments from some industries would be more beneficial to a host than FDI from firms in other industries. We have so far shown that the overall benefits from FDI are higher, the lower is the industry risk (as X is a declining function of ρ). But we have been assuming that all industries face the same demand conditions when they are in business; the only difference between them being their likelihood of dying.

In reality, it is often the case that there is a link between uncertainty and future market conditions. If, for example, we compare a new industry with an established one, the uncertainty about the future market conditions is probably higher for firms in the new industry. However, should the industry succeed, it may well be that the sales and profits each period are higher than for firms in the old industry. Hence, though the new industry is more risky, it may also be more attractive because of better market conditions should it succeed.

In this section we will alter the model slightly, in order to capture the effects of an assumed systematic correlation between uncertainty and sales. There are obviously many possible ways of specifying this; here we will only give one simple example. As an alternative to the demand function in (1), let the demand for goods from industry k be:

$$p_k = a - b(1 - \rho_k)x_k \quad (12)$$

This specification ensures that the expected sales revenues in each period are the same for all industries.⁵ If a firm is likely to die sooner, as it is in a high-risk industry, then it should be more profitable during its short lifetime than a firm that has a longer expected lifespan.

With this as the only change to the model, we can easily work out expressions for expected profits and optimal choices in the same way as we did above. We do not reproduce

⁵ Expected sales is the weighted sum of the firm's sales while in business, with probability $(1 - \rho)$, and 0 with probability ρ .

all the stages in the process, but jump to the key expressions for our analysis. The expected return to the firm of establishing a plant in a location is now:

$$R = \frac{[a - \beta(w + \delta\rho r)]^2 - (1 - \rho)4bF}{4b[1 - \delta(1 - \rho)]} + (1 - \rho)S \quad (13)$$

while the minimum subsidy needed to achieve a return equal to R can be written:

$$S^R = \frac{1}{1 - \rho} \left[R - \frac{[a - \beta(w + \delta\rho r)]^2 - (1 - \rho)4bF}{4b[1 - \delta(1 - \rho)]} \right] \quad (14)$$

The benefit for the host country becomes:

$$B = \frac{\beta(w - v + \delta\rho r)[a - \beta(w + \delta\rho r)]}{2b[1 - \delta(1 - \rho)]} - (1 - \rho)S \quad (15)$$

and the accompanying maximum subsidy the government can offer given a benefit level of B can be written:

$$S^B = \frac{1}{1 - \rho} \left[\frac{\beta(w - v + \delta\rho r)[a - \beta(w + \delta\rho r)]}{2b[1 - \delta(1 - \rho)]} - B \right] \quad (16)$$

Figure 3 shows the S^B and S^R for this new specification of the model. The new features are that the S^R -locus may now be downward sloping, whereas S^B is less negatively sloped than in the previous specification, and it may even be increasing in ρ in certain circumstances. These changes reflect the fact that investments in higher risk industries have become more attractive, both for the firms and the host countries, since profits and employment are relatively higher during the period of operation of the plant.

The combined benefits for the host country and the MNE are again given by the X , which can now be written:

$$X = \frac{1}{1-\rho} \left[\frac{[a - \beta(w + \delta\rho r)][a + \beta(w - 2v + \delta\rho r)] - (1-\rho)4bF}{4b[1 - \delta(1-\rho)]} - (B + R) \right]$$

Figure 4 shows X for the same sets of parameters as in Figure 1 above. Two interesting features should be noticed. First, the ranking of cases is the same as in the above model. Hence, the summary provided in Table 1 of the outcome of policy competition continues to apply. Secondly, the X -loci are “U”-shaped, indicating that low-risk and high-risk industries are more attractive than those in the middle. In the previous demand specification, all countries would prefer to attract investments from the low-risk industries, but those with more flexible labour markets were more competitive in attracting higher risk investments. Now, because the higher risk is associated with greater rewards, these high-risk firms may actually be more attractive to a host with a flexible labour market than FDI from a firm in a more stable, low-risk industry.

5. CONCLUDING REMARKS

In an uncertain economic environment, firms must make investment decisions in anticipation of bad times as well as good. The labour-market conditions of potential hosts can therefore be crucial in determining where an MNE decides to establish production facilities. We have investigated two factors associated with this: redundancy payments and opportunity wages. The first one has to do with labour-market flexibility; it matters for an MNE’s investment decision through its influence on exit costs, should the market fail in the future. When planning an investment the MNE will take into account entry costs (or incentives) as well potential exit costs, and the higher the exit costs are, the more entry incentives will be needed to make the location attractive for the firm. Opportunity wages – the wage in the best alternative employment – on the other hand, say something about the value for the host

country of the extra employment associated with inward FDI. The lower the alternative wage, the more eager is the potential host in making its location attractive to the MNE.

In such a setting, we study optimal policy for a host country, as well as policy competition between several potential hosts. For the MNE, the mix of labour-market flexibility and investment incentives determines its preferred location. For the potential host country, there is a trade-off between the value of extra employment and the cost of the necessary investment incentives. It should come as no surprise that a country with flexible labour market and low opportunity wages will tend to win any policy competition for inward FDI. The reason is simply that such a country would have the most attractive labour-market conditions and in addition be willing to offer high investment subsidies. There will obviously be net gains from FDI in such a country; the distribution of gains between the host country and the MNE will, however, depend on the bargaining power of the parties involved. If there are several potential hosts with similar conditions competing for the investment, the MNE will typically have the stronger position and get most of the gains.

More interesting, however, is our comparison of countries with different attributes. Rigid labour-market regulation is a disadvantage for a country when it comes to attracting foreign FDI; however, if it values the extra employment high enough, it may still be able to win certain types of inward FDI. Typically, that would be FDI in industries with a relatively low risk of failure, as firms in such an industry would care more about entry incentives than potential exit costs, should the market fail some time in the future. A country with high opportunity wages but a more flexible labour market would, on the other hand, typically win the policy game for investments in more risky industries. Although such a country will not be willing to offer high investment subsidies, the market flexibility may be assessed as more important for the firms in risky industries.

We have suggested that risk may be associated with newer technologies, characterised by high rates of product innovation and technological advance. While some new products may be successful and manufactured for a long period, others will have a short lifespan. In contrast, low-risk industries may be associated with the more established, traditional types of product or production process. In such a setting, we see that, in order to attract the newer and more uncertain industries, flexibility in the labour market may be more important than direct subsidies or other kinds of initial support to the MNE.

If industries are identical apart from their risk of collapse, then from the host country's point of view, it is clearly an advantage to attract the least risky industries. If, on the other hand, there is a positive correlation between the uncertainty of an industry and the level of demand and profitability should it succeed, then it may actually be more beneficial to attract investments in the more uncertain industries. Even if these have a higher risk of failure, and thus a shorter expected life span, the extra benefits that they generate while in operation may be high enough to tip the balance. And again, labour-market flexibility may then be the most important factor in the policy mix of the successful host country.

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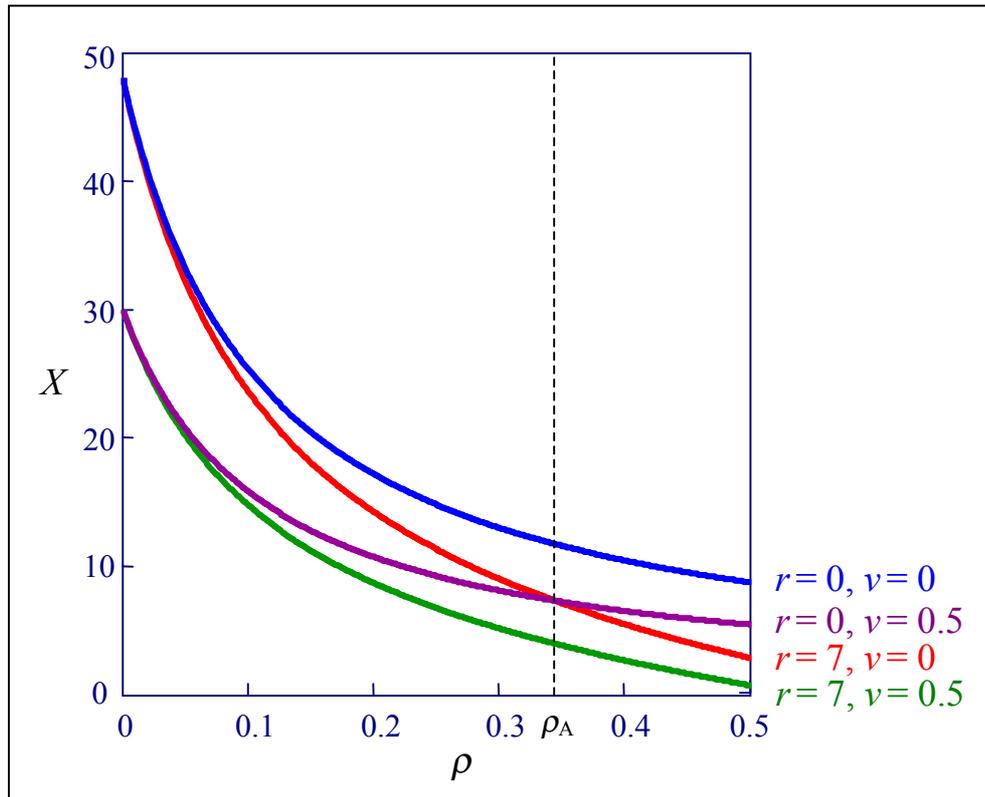


Figure 1

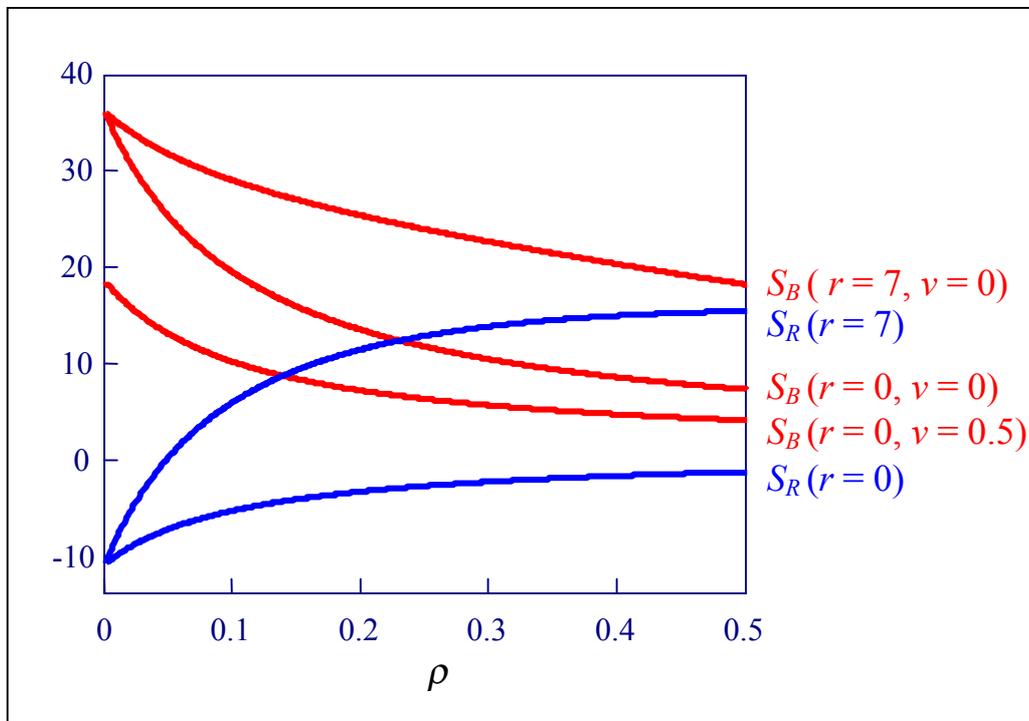


Figure 2

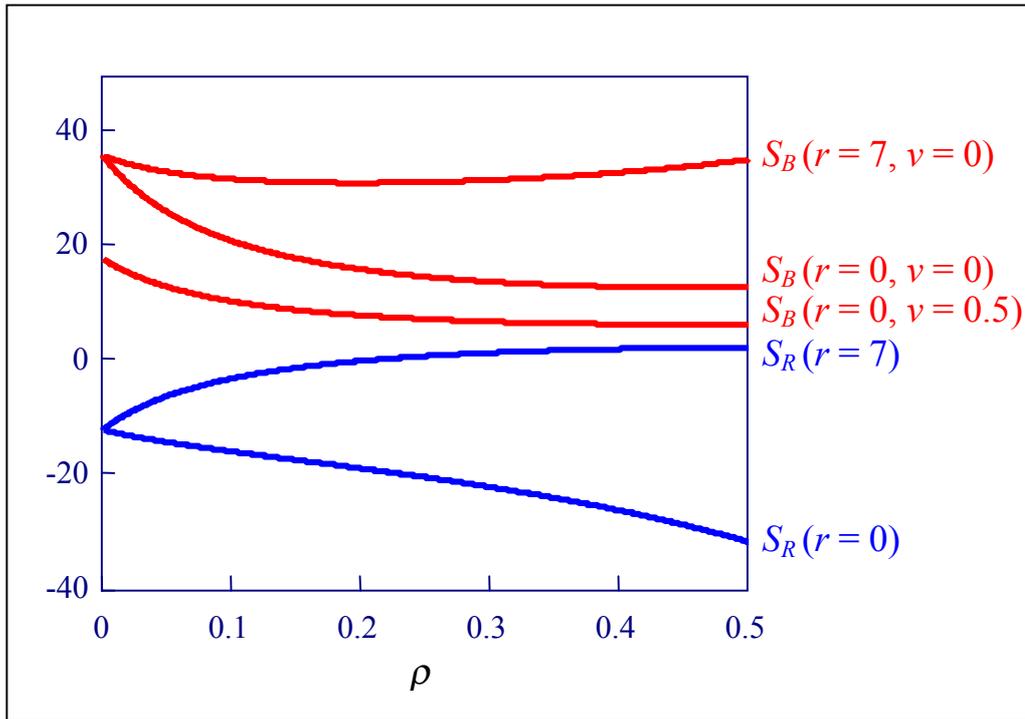


Figure 3

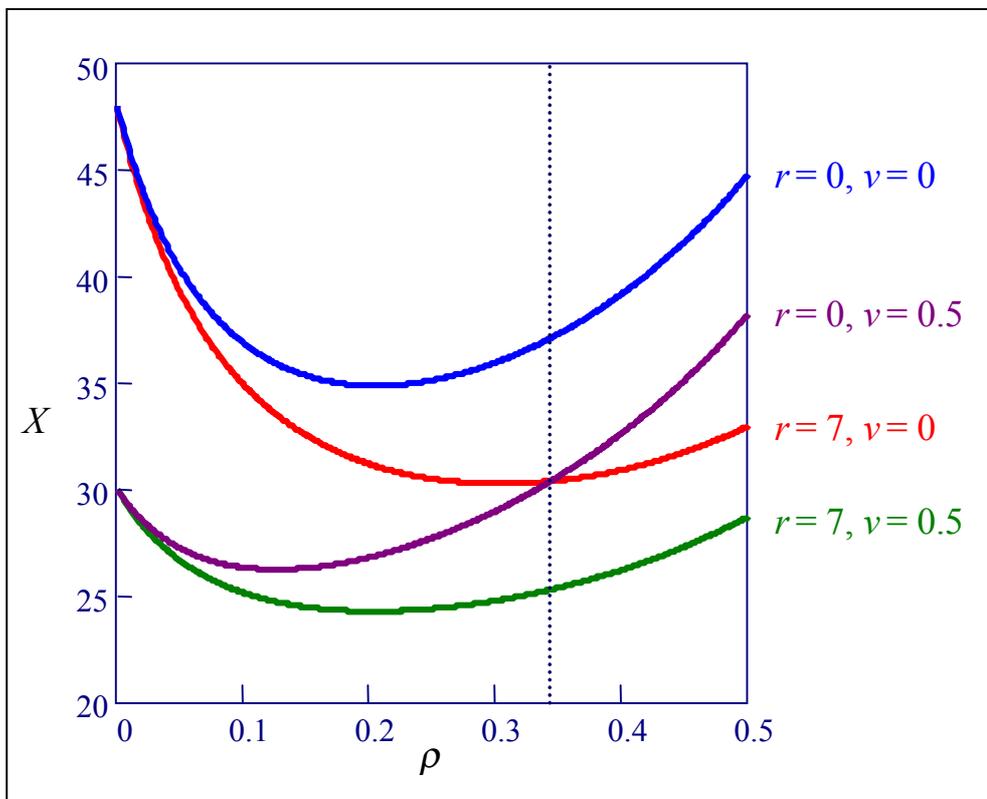


Figure 4