Unemployment of the Educated and Emigration of Post-Secondary Graduates from the LDCs

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INTRODUCTION

Emigration of educated manpower from the LDCs to the industrialized countries has long been the subject of intense debate, and attempts at policy intervention to affect the migration flows have been made at both the national and international levels. At the national level, the sending countries have tried to use devices such as making graduates post bonds when leaving for post-graduate training in industrialized countries, in order to put pressure on them to return home. The receiving countries have imposed strict controls on all kinds of immigration from the LDCs, including the immigration of educated manpower. These restrictions have sometimes been represented as reflecting a concern over the possibility that an excessive migration rate might harm the sending countries, though in reality they have probably resulted as much from pressure by domestic interest groups who have tried to forestall competition from immigrant manpower. In the 1970s, there was also extensive discussion of the possibility of introducing an internationally administered tax on migration, the proceeds of which would go to the sending countries. This proposal will be further discussed below.

Most of the concern surrounding the migration issue has focused on the possibility that emigration of educated manpower will reduce the welfare of the non-migrants remaining in the sending LDCs. With respect to the migrants themselves, most people would probably be willing to accept the proposition that a person (or family) who voluntarily decides to emigrate (or to send one of its members abroad, in the case of a joint family decision) will do so only if there is a reasonably firm expectation that the migrant's (or the family's) welfare will, on balance, increase through a move. An overall evaluation of the welfare effects of emigration should presumably be based on some type of weighting of both the impact on non-migrants *and* the (positive) impact on the migrants themselves. This has, however, not been

the usual approach in the literature: the welfare of the migrants themselves has generally not been taken into account. Towards the end of the paper, I shall comment briefly on the consequences of modifying the analysis so as to consider the impact on the migrants themselves; in the mean time, I shall follow convention and focus primarily on the effects on "those who remain" (non-migrants).

In the discussion of the migration issue during the 1950s and the '60s, the general presumption was that the "brain drain" would be harmful to those remaining in the LDCs. The essential conclusion from the work of authors such as Grubel and Scott [9], Berry and Soligo [1], and Harry Johnson [12] was that migration would reduce the welfare of non-migrants if the migrants' contribution to national income exceeded the income they received for their contribution. In the decades following World War II, many LDCs were faced with a situation in which there were relatively few educated persons to fill the increasing demand for skilled manpower. The demand for such manpower was growing both because the pace of social and economic modernization was accelerating and because, in many cases, the advent of political independence had led to an exodus of skilled foreign administrators. Thus, even though educated manpower was relatively well paid, the general perception was that, on average, the potential contribution of educated persons to output was greater than the incomes they received. According to the analysis at that time, the brain drain was thus seen as disadvantageous to those who remained behind.

Partly in response to the shortage of skilled manpower, the post-secondary educational systems in the LDCs expanded at a rapid pace during the '60s and the '70s. Within a few decades, the market for graduates changed from one of relative scarcity to one of incipient oversupply, with tendencies towards falling relative incomes of educated manpower, and the emergence of a problem of graduate unemployment.[1]

In these circumstances, it seems reasonable to believe that the expected marginal contribution to domestic output of additional educated manpower was becoming smaller and smaller. Conversely, emigration of an educated person would now be expected to lead to a correspondingly smaller reduction in domestic output. Furthermore, if unemployed graduates share in family consumption even though they do not contribute to income, the departure of a graduate would necessarily imply a potential net increase in the real consumption level of non-migrants. This argument also applies to a situation in which there is disguised rather than open graduate unemployment. With relatively rigid wages of educated manpower, and growing graduate unemployment, there would be increasing pressure on governments to do something to alleviate the situation. As a result, government may be forced to

employ graduates even though the public sector may not be organized to make productive use of their labour.[2]

If the ultimate effect of emigration is simply a reduction in the number of unproductively employed post-secondary graduates in the public sector, there will be little or no reduction in output and a net increase in the real consumption potential of non-migrants.

In situations of this sort, therefore, the earlier analysis would have suggested that a "brain drain" would imply a net *benefit* to non-migrants. Allowing for the increase in the welfare of the migrants would obviously further strengthen the presumption that the migration process would be welfare-improving.

The early analysis on which the preceding conclusion was based was essentially static in nature in that the brain drain was looked upon as coming from a given and fixed stock of educated workers. If the analysis is extended to a dynamic framework, it becomes more complicated. The brain drain must then be viewed as an ongoing process in which a certain number of educated workers emigrate each year. At the same time, it must also be recognized that new human capital is continually being created through education which adds new graduates to the existing stock. The brain drain can then be interpreted as a process through which a certain amount of the newly created human capital "leaks out" from the LDCs each year.

Even if one interprets the brain drain in this dynamic fashion, however, the logic of the early analysis of Grubel & Scott and others (henceforth denoted as GS) still seems sensible. For example, suppose that there are rigidities in the market for post-secondary graduates, so that there is substantial graduate unemployment. The GS logic may then be interpreted as saying that the brain drain acts as a partial safety valve which reduces the extent to which the flow of new graduates adds to graduate unemployment, and frees some resources that would otherwise have been consumed by unemployed graduates.

But while the GS logic continues to appear plausible in a dynamic framework, much of the more recent work on the effects of the brain drain seems to contradict it. In their important 1974 paper [3], Bhagwati and Hamada (henceforth BH) conclude:

> Thus in our model, even without invoking the presence of [positive] 'externalities' (leading to differences between the private and social

marginal product of the emigrants), we see that the emigration of educated labour can easily lead to unfavourable effects on national income [and] per capita income (p. 34).

Since they arrive at this conclusion in the context of a model in which wages for educated workers are not market-determined and in which new graduates simply swell the ranks of the unemployed, their result appears clearly inconsistent with the GS logic.

RECONCILING THE GRUBEL-SCOTT AND BHAGWATI-HAMADA APPROACHES

In a related paper [6], I have shown that the key difference between the specifications employed in the GS and BH approaches relates to the way the amount of human capital in the economy is determined; it is this difference that generates the seeming inconsistency between the conclusions of the two approaches. The nature of the difference is as follows. When one uses the GS approach in a dynamic context, one implicitly assumes that the flow of new graduates is exogenous to the model: the flow of investment in human capital is insensitive to variations in the private profitability of education. In the BH approach, by contrast, the flow of graduates is assumed to depend on the expected private return to human-capital investment. This assumption need not imply that education is privately *provided*; if education is provided in the public sector, the amount spent on education may indirectly respond to the private profitability of human-capital investment through the political system. But whatever the underlying justification, the fundamental assumption is that the rate of investment in education is endogenous and responds to the perceived private return.[3]

An intuitive explanation of why the brain drain is likely to be detrimental to the sending LDCs in a situation with graduate unemployment and an endogenous rate of human-capital formation can be provided along the following lines. To begin with, let us consider a preliminary question: when the decision to invest in education depends on the private profitability of education, should one not expect the existence of graduate unemployment to reduce the number of students entering the educational system, thereby eliminating the initial unemployment? The answer is that this need not happen if it is not known *in advance* which particular graduates will be unemployed after graduation. When this is the case, the decision by a given student whether or not to enter the post-secondary system will depend on the *expected* return on the investment in education. The expected return will depend

both on the expected wage rate of educated workers and on the probability that a student will in fact be employed upon graduation. Even if the prospective students expect that there is *some* probability that they will become unemployed after they graduate, they may still decide to acquire education if this probability is not too high, and if the wage rate they expect to be paid, if they *do* become employed, is attractive. For this reason, investment in human capital may continue to take place even if graduate unemployment persists; under certain assumptions, one can show that graduate unemployment will converge to an equilibrium level which depends positively on the (exogenous) wage rate of graduates.

Notice that this finding is very similar to the finding in the Harris-Todaro model [11] in which they show that rural workers may continue to migrate to the cities even if there is open unemployment in urban areas; they will do so as long as their *expected* earnings in the urban areas (i.e. the urban wage rate multiplied by the probability that they will in fact be employed in the cities) is greater than rural earnings. In the Harris-Todaro model, too, there is a tendency for the unemployment rate (of urban workers) to converge to an equilibrium level greater than zero, even though it would be possible for unemployed urban workers to move back to the rural sector where they would be able to earn an income. One may also note that both graduate unemployment in the BH model of the market for educated labour and urban unemployment in the Harris-Todaro model can be interpreted as arising from the so-called "rent-seeking" behaviour. In both cases, the ultimate reasons why unemployment exists is that there are rigidities which maintain the wage rates (of graduates and workers in the urban modern sector respectively) at a level higher than the opportunity cost of attracting workers to this part of the labour market. The differences between the wage rates and the opportunity costs can be interpreted as rent, and unemployment results because individuals seek access to these rents through education or migration. Notice further that an inefficient equilibrium with rent-seeking does not necessarily require that there be open graduate unemployment. Instead, rent-seeking may manifest itself in a large proportion of graduates ending up employed in jobs for which they are over-qualified and which do not pay enough to justify (*ex post*) the graduate's opportunity cost of getting educated.[4]

Now consider what happens if we introduce the possibility of migration to an industrialized country in a model in which investment in human capital is endogenous and there is graduate unemployment and rent-seeking. The key question is: What will happen to the expected return to education in response to migration

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[3]The assumption of an endogenous rate of investment in education is also used in the analyses of McCulloch and Yellen [14; 15] and Rodriguez [16].

[4]The consequences of rent-seeking through overinvestment in education are analysed in Blomqvist and Mohammad [8]. The pioneering paper on rent-seeking in general is that of Krueger [13].

opportunities? The answer is that as long as *some* graduates will have the opportunity to emigrate and get a job in a high-wage industrialized country, and it is not known in advance which particular individuals will get this opportunity, the expected return to education will rise for all prospective graduates. Thus, there will be a tendency for more students to enter the educational system. Some of the increase in the inflow to the system will be offset by the outflow of graduates to other countries. But it is easy to show that in the long run the outflow through migration will not be enough to prevent an *increase* in the equilibrium graduate unemployment rate. Thus, from the viewpoint of those who remain in the sending LDC, the principal effect of introducing emigration opportunities for graduates will be an increase in the amount of graduate unemployment, and this will reduce per capita income and consumption.[5]

It is now easy to see that the assumption of endogenously determined human-capital formation is critical to this conclusion. If, as in the GS approach, the number of graduates is exogenously determined and is not allowed to respond to the increase in the expected private return to investment in education, it is clear that increased emigration will tend to *reduce* the rate of graduate unemployment. Thus, under the GS approach per capita income and consumption of non-migrants will rise rather than fall.

IMPLICATIONS FOR POLICY — I:
EDUCATIONAL FINANCING

In the remainder of this paper, I shall discuss some of the policy implications of the insights yielded by this analysis. In doing this, I shall mostly stay within the framework of the BH approach and assume that investment in education is endogenous. The discussion will focus on two principal issues: the financing of post-secondary education, and the proposals for an international "brain drain tax".

With respect to the financing of higher education, an important point should first be noted. If the amount of investment in education is determined by the expected private return to education, then a government subsidy to cover the cost of such education will tend to cause an excessive amount of investment in human capital even if wages of educated labour are flexible so that there is no graduate unemployment and even if there is no international migration. The logic is straightforward. Students will keep entering the post-secondary system until the private return to education has fallen enough to become comparable to the return on other kinds of investment. But if the private returns on investment in human and non-human capital are the same, then the social return on investment in human capital must be below that on non-human capital. This follows because that part of the cost of education which is paid for by the government does not enter the calculation of private profitability. It should, however, be counted in the social-return calculation.

If wages are not flexible, so that in equilibrium there is unemployment of graduates, matters become even worse. In that case, a subsidy to education will just raise the rate of graduate unemployment; it will not lead to an increase in the number of employed graduates since that number depends on the wage rate for educated labour which is fixed by assumption. Looked at differently, when there is graduate unemployment, investment in human capital is, in part, unproductive rent-seeking. A government subsidy to post-secondary education will then essentially amount to subsidization of rent-seeking.[6]

Introducing international migration in this situation is likely to further aggravate the inefficiency. As discussed above, when there are opportunities for some graduates to emigrate, the tendency toward rent-seeking will be reinforced. As a result, an implicit subsidy to rent-seeking through education will have even more detrimental effects.

The preceding reasoning adds further support to the already strong case for reducing the extent of explicit and implicit subsidy to post-secondary education in many LDCs. In addition to subsidies being inefficient (for the sorts of reasons that have just been discussed), many studies have already shown convincingly that in practice they tend to be regressive since children from high-income families are more likely to enter the post-secondary system than children from low-income families. And the argument that, with imperfect access to capital markets, subsidies are necessary in order to make it possible for *any* low-income families to send their children to university is not valid if there is some type of government loan scheme (perhaps with repayment being conditional on a student's income after graduation) on which talented children from low-income families can draw.

An alternative method for reducing the extent of rent-seeking through subsidized education would be to directly control the number of students allowed entry to the subsidized system. (Analytically, this would be equivalent to an exogenously determined limit on the amount of human-capital investment.) According to the GS logic, such a measure would eliminate the efficiency losses from

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[5] Stated more precisely, the assumption underlying this reasoning is that only *some* of those graduates who wish to emigrate will have the opportunity to do so. This is the assumption implicitly used in Bhagwati and Hamada [3] and in McCulloch and Yellen [14]. In contrast, in Rodriguez [16] and McCulloch and Yellen [15], it is assumed that industrialized countries will accept every graduate who wishes to immigrate. It is not difficult to see that with this assumption the effects of migration opportunities will be different. Then there would be no graduate unemployment in the LDCs, and wages of graduates in the LDCs would rise to the same level as in the industrialized countries (abstracting from costs of migration). The assumption that only a limited number of LDC graduates will be allowed to immigrate to the industrialized countries does seem more realistic than the alternative, however.

[6] The combined effects of subsidies to education and rent-seeking through overinvestment in education are formally analysed in Blomqvist and Mohammad [8].

the brain drain, and it could also be used to limit the extent of unproductive competition for rent-bearing domestic jobs in the private or government sectors.[7]

However, one of the disadvantages of the measures which try to control the amount of rent-seeking without eliminating the rents themselves is that they may not do away with rent-seeking but, instead, force it to take other forms. For example, if post-secondary education continues to be subsidized but the number of places in post-secondary institutions are controlled and students are admitted by competitive examination, the result may be rent-seeking through additional resources being used in the secondary-school system simply to prepare students for these examinations. In the world of practical policy-making, where it is unrealistic to expect sudden and dramatic changes in policy, the sensible way to interpret this, in my view, is as a recommendation for a two-pronged policy. To keep the post-secondary system from over-expanding, a sensible strategy probably involves *both* direct limitations on the number of students admitted *and* a gradual reduction in the level of explicit and implicit subsidy.

IMPLICATIONS FOR POLICY – II:
A BRAIN DRAIN TAX

One of the potential problems with a government loan scheme involves ensuring repayment of loans by individuals who have emigrated to foreign countries. A consideration of this problem leads directly to the more general issue of financial transfers from the industrialized countries which receive educated manpower to the sending LDCs, and more specifically, to the various proposals for a "brain drain tax" which can be thought of as legislation making one such type of transfer compulsory.[8]

The precise effects of a brain drain tax would depend on the exact provisions of the international agreement that would have to be concluded to introduce such a tax. There are several possibilities.

Firstly, part or all of the tax might be levied on the migrants themselves, as an "exit tax" imposed by the sending LDC, or as a separate tax levied on educated immigrants by the receiving industrialized countries (in addition to their normal taxes on other persons with similar incomes) and remitted to the sending LDC.

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[7]Note that this alternative is analogous to one of the policy conclusions of Harris and Todaro in their original analysis of rural-urban migration. They showed that the extent of the efficiency losses from excessive migration and open urban unemployment could be reduced by direct restrictions on migration to the cities.

[8]Much of the debate on a brain drain tax originated with the proposal outlined in Bhagwati and Dellalfar [2]. A comprehensive discussion of various technical aspects of a brain drain tax is contained in the contributions to Bhagwati and Partington [4]. Hamada [10] has a useful summary.

If all or part of the tax is imposed on the migrants, their expected net foreign earnings would be reduced.[9]

Secondly, and especially if only a part of the tax is levied on the migrants, the receiving countries would have an incentive to reduce the rate at which educated LDC migrants were allowed to enter. In other words, they might react by reducing the flow of LDC graduates they were prepared to admit. This would result from the fact that the social profitability to the receiving country would be reduced by that part of the tax which would represent a pure transfer, from existing tax payers in the receiving country, to the sending LDC.

Thus, in assessing the effects of a migration tax, one should take account not only of the direct transfer, but also of the indirect effects through any induced changes in the amount of migration and in the prospective earnings of the migrants. If only the transfer effect is taken into account, the goal of the sending LDCs presumably ought to be to negotiate a tax agreement that would maximize the revenue from the tax (the amount transferred from migrants and/or other tax-payers in the receiving countries). However, when indirect effects are also taken into account, the expected revenue from the tax is no longer the only relevant consideration.

As an example, consider the case in which the rate of investment in education is taken as endogenously determined (as in the BH framework) and there is graduate unemployment because of wage rigidity in the market for educated labour. In that case, the optimum rate of brain drain tax (from the viewpoint of the sending LDC) is likely to be considerably higher than the revenue-maximizing rate. The reason is easy to see. Depending on how it is designed, a brain drain tax will either reduce the expected earnings of migrants, or reduce the flow of migration that the receiving countries will permit, or both. In any case, the effect will be to reduce the amount of wasteful rent-seeking through education and the equilibrium graduate unemployment rate. This follows because the indirect effect of the tax is to reduce that component of the expected return to education which is due to migration; it does this by lowering the probability that a graduate will have the opportunity to migrate and/or by decreasing the expected earnings of those who do get this opportunity. But in determining what the optimum rate is from the sending country's point of view, this reduction in the losses from unproductive rent-seeking should be added to the expected revenue from the tax. Taking account of this effect will yield an optimum rate higher than the revenue-maximizing one. The difference is especially

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[9]In general, the participants in the debate concerning the form of a brain drain tax have opposed the exit tax alternative, on the grounds that it would be discriminatory (if not prohibitive) towards poor prospective emigrants in the context of imperfect LDC capital markets. On the other hand, objections have also been raised against the alternative on the grounds that discriminatory taxation of immigrants may be unconstitutional in the receiving countries; see the discussion in Hamada [10] and the references given there.

likely to be large if the efficiency losses from over-investment in education have been magnified by large subsidies of the cost of post-secondary education.

On the other hand, suppose the government is successful in limiting the amount of unproductive rent-seeking by some combination of reduced subsidization and restrictions on the number of students who are allowed access to post-secondary education. With such restrictions, we saw above that the brain drain may be beneficial in the sense that it would reduce the amount of graduate unemployment (or the number of the graduates employed by the public sector in unproductive jobs, if the government has tried to reduce the amount of open graduate unemployment). In that case, any induced reduction in the number of the graduates allowed to immigrate into the industrialized countries would harm those remaining in the sending LDC. In that case, therefore, the loss from any such reduction in the flow of migration should be *subtracted* from the revenue effect of a brain drain tax in determining what rate would be optimal from the viewpoint of the sending LDC. As a result, the optimum rate would tend be *less* than the revenue-maximizing one in this case.

CONCLUDING COMMENTS

Let me now finally turn to the question of what conclusions can be drawn from the preceding analysis. Perhaps the principal conclusion is that evaluating the impact of educated-labour emigration on the sending LDCs is a very complex problem, given the large number of the factors that affect this impact. A list of the factors that have been identified above as critical would include

(a) the rigidity or flexibility of the wage in the market for the services of educated labour;

(b) the extent of government subsidy (explicit or implicit) of the cost of post-secondary education;

(c) the extent of responsiveness of the investment in education to the private return on such investment or its being exogenously controlled by the government; and

(d) the type of restrictions (if any) imposed by the receiving industrialized countries on the migration flows from the LDCs.

Since the LDCs differ in their labour market policies, in their policies towards the financing of higher education, and in the opportunities for their citizens to emigrate to industrialized countries, it is clear that the best policy strategy for minimizing the detrimental effects of the brain drain will be different for different LDCs. Perhaps all that can be said at a general level is that for most countries, the best strategy in practice is likely to involve a combination of partial moves: increasing the wage flexibility in the market for educated labour (particularly in the public sector); reducing the extent of subsidy to post-secondary education (perhaps through some type of loan scheme); and trying to negotiate some sort of brain drain tax with industrialized countries.

If one looks at the migration issue in the context of this type of policy package, it is in fact possible that emigration should not be considered as a detrimental "brain drain". In a proper policy environment, permanent or temporary emigration of educated LDC workers in response to financially attractive jobs in foreign countries may in reality be beneficial. This suggestion can be made even more strongly if we introduce two further considerations that were neglected above: voluntary remittances of emigrant workers to relatives at home, and the increased welfare of the migrants themselves. (Note that private remittances in fact play a role similar to the transfer effects of a brain drain tax.) When we allow for these factors as well, it becomes plausible to argue that the prime policy objective for most of the LDCs should not be to devise ways of restricting migration, but, instead, to design policies to increase the potential benefits that international migration of educated labour can yield to the sending LDCs.

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Comments* on

"Unemployment of the Educated and Emigration of Post-Secondary Graduates from the LDCs"

The strength and innovative nature of this work lie in bringing dynamics to bear on a problem that was so far essentially trade-theoretic and had been handled by trade theorists. I would like to emphasize the strength of this and take this dynamic aspect of the paper as the departing point for my discussion. What Prof. Blomqvist has done is essentially to formulate a two-asset growth model, one of those assets being physical capital stock and the other being human capital stock. Before I discuss this aspect of the model, let us go back a little and talk about dynamic economics. Dynamic economics is essentially two-fold — one is descriptive, the other is normative. The descriptive side tries to see how the political economy behaves over time and the normative side tells us how it should behave over time. The exercise here, as I see it, is essentially descriptive. The author has formulated a two-asset differential equation model which somehow depicts how the stylized economy is going to evolve over time. He does not bother about the actual paths of adjustment; he takes the steady state and sees how he can change the various parameters and what is going to happen to those steady states. That is the basic summary of the paper. Now the first problem that I see with this is what has now come to be known in the dynamic literature as the Hahn problem. That is simply a correction of Solow's original growth paper of 1956 — that the competitive system does not by itself, as if it is led by invisible hand, reach the balanced-growth path simply on account of two capital goods. This is because of an equation which equalizes the real rates of return. Thus the prices may give one wrong information; they may steer one away from the balanced-growth path. The jargon here is myopic perfect foresight, which locks each agent into expectation and those expectations are self-fulfilling. And there is no ability for the economy to give correct real-term signals. Prof. Blomqvist totally abstracts from these problems. In a sense, one way of trying to handle this is through some rational expectations equilibrium whereby the agents have foresights so far into the future that they can single out errant

trajectories and then pick out those trajectories which take you to equilibrium. I don't know if that assumption would be valid here or not, but that is something to think about. That is one thing; but sticking again to his descriptive side and forgetting the Hahn problem for the moment, I particularly like the paragraph where he talks of expected wages and expected rates of return; and there, of course, Blaug is one of the references. Blaug did this some time ago. Harris-Todaro hypothesis is again raising its head and one would like to see what would happen if we go on that count.

But let me go back to what I see as the fundamental driving part of the paper and that is equation 10 and what Prof. Blomqvist is calling the social rates of return. Whether consumption should be increased or decreased depends on the diversity or the differentials between the rates of return. Let me, as food for thought, try to short-circuit the entire appendix and ask the author to add equations 3 and 4. your have $\dot{e} + \dot{k} = \sigma F (k, e) - ne - me - nk$. Since you are not talking about dynamics let us go back to the nuclear golden rule and equate these differentials to zero and try to maximize the steady-state consumption with respect to the variety of parameters. What do you get? $\frac{dc}{dk}$ and $\frac{dc}{de}$ and what appears — you get $f - n$ and $f_e - n$ which you call social rates of return. I would call them private rates of return. Equate them to zero and there you have directly, without any linearizations equations for the optimal stock of physical and human capital. Then it is straightforward. If one is greater than the other, then your parameters should argue that it should be increased or decreased. A lot of those conclusions would follow.

My last technical point relates to a result which I think it is high time the theorists should take seriously — namely stability of the linearized trace. The condition used is that the linearized equation implies stability. However, stability does not imply this. A simple counter-example would be a differential equation of the kind $\dot{X} = - Xq$ where the trace and determinant conditions would not hold, but the system would nevertheless be stable! I would stop here.

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