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Migration: the economic calculus of immigrant countries

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Kiel Working Papers

Kiel Working Paper No. 583

Migration: The Economic Calculus of Immigrant Countries

by

Hugo Dicke and Hans H. Glismann



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Introduction*

It is widely held that the Red Indians made a big mistake by not preventing the Palefaces from immigrating. The power of the Palefaces - based on their more developed technologies and a firm belief in cultural and racial superiority - made the Red Indians virtually disappear. The lesson from this experience is that the immigrant countries do not necessarily benefit from immigration whereas, on the contrary, countries of origin may prosper from transfers of wealth as well as from a decline in the number of the people to be fed.

Nonetheless, in the Western hemisphere of today immigration is considered to be socially as well as economically beneficial for the immigrant countries and detrimental for the countries of origin. This may not be counterfactual to the historical experience, because - as opposed to the Palefaces/Red-Indians case - today's immigrants into the western countries are in general not endowed with superior productive knowledge and techniques, although ethnic heterogeneities are still a common feature.

The immigration issue has attracted a lot of attention among economists in recent years. The library of the Institut für Weltwirtschaft Kiel alone comes up with 1244 publications on migration since 1988.¹ To be sure, there are many studies catalogued before 1988 and some are bound to appear after June 1993. As to the first, Bhagwati [1985] investigated into the global welfare gains of free international migration and their regional distribution; Schatz [1985] made substantial reservations on Bhagwati's conclusions. As regards the most recent publications on this topic we find: Faini and Venturini, [1993], about the performance of immigrants,

* We want to thank our colleague Axel D. Neu for valuable comments and suggestions.

¹ As of June 1, 1993.

R.B. Freeman [1993] about the effects of migration on the native labour force, and M.C. Burda [1993] about the individual intentions of migrants. A mere two studies out of the 1244 are devoted to the welfare effects of immigration on the native residents of the country of destination [Basu, 1992; Ernst, 1987].

Indeed, immigration is very topical today. With restrictions to emigration out of Central and Eastern European countries gone, and with tremendous income differentials existing between Western and Eastern Europeans a wave of immigration into Western Countries can be observed. These prospects lend more relevance to the question of how immigration affects the immigrant country.

This paper is about the economic calculus of the immigrant developed country. It will be analysed whether migration is detrimental to the welfare of a recipient country, or whether the divergencies between immigrants and native residents are rather a source of welfare increases. The analysis is based on neo-classic economic theory. Legal or political aspects of immigration will not be considered.

The structure of the paper is as follows: Chapter 1 is concerned with an evaluation of the effects of diverging welfare functions of immigrants and native residents; this analysis will operate with constant factor proportions. Vice versa, chapter 2 allows for changing factor proportions but assumes welfare functions of immigrants to be identical to the ones of native residents. In the final chapter we turn away from macro-economics and analyse the micro-economics of migration both in the presence of externalities and without externalities.

Chapter I - Immigration Under Constant Conditions of Production

At a first glance it seems to be hard to argue in favour of a situation where the country of immigration does not experience, simultaneously with immigration, a change in its endowment with productive factors and, hence, an increase in its production possibilities. However, in the case of highly developed countries, such as Germany and the United States, immigration is tolerated but at the same time the ordinary law forbids many of the immigrants to look for employment. This may lend some empirical relevance to the assumption of a constant factor endowment underlying this chapter.

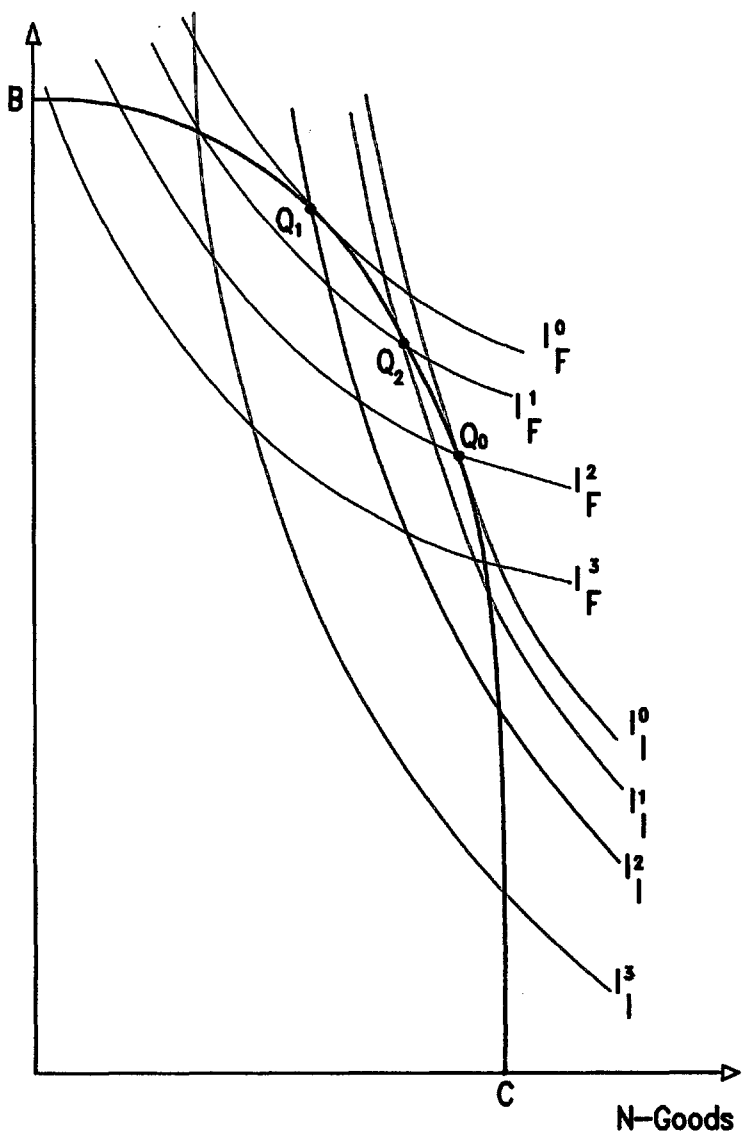
The traditional macro-economic model of allocation allows for two goods which in the following will be labelled public goods and services ($= N$ goods), and private goods ($= T$ goods) respectively; public goods and services include, among others, the supply of external and internal security. The national optima in the level as well as in the structure of production and consumption are attained at point Q (as depicted in graph 1), where the curve of production possibilities ($= BC$) is tangential to one of the social curves of indifference ($= I$).

With respect to the migration issue it can be either supposed, that immigrants are different from native residents with respect to preferences (this would represent the often cited multicultural aspect of migration), or that they have identical preferences. As regards the first variant, diverging preferences of immigrants may prevail in the case of immigration from low-income countries, where immigrants are less endowed with private goods and, therefore, are more inclined to spend their income on T goods rather than to save or to spend taxes for the production of N goods. In graph 1 this multicultural aspect of migration is illustrated by

Graph 1 -

Immigration under Constant Production Conditions

T-Goods



the diverging indifference curves I_i of native residents and I_F of foreigners.²

Quite obviously, under conditions of fixed production functions two points of allocation would be optimal, Q_0 for native residents and - hypothetically³ - Q_1 for immigrants. Q_1 would be equivalent to a decline in welfare for native residents from I_i^0 to I_i^1 . The same reasoning applies when comparing Q_0 with Q_1 from the immigrants' point of view: Q_0 would represent a decline of immigrants' welfare from I_F^0 to I_F^1 . Let us assume that the market and political processes will come up with a final solution between Q_0 and Q_1 say, Q_2 . The Q_2 situation implies that native residents will be worse off than before migration ($I_i^1 < I_i^0$): the supply of public goods and services is lower, when compared to their optimal level. The same reasoning applies for the situation of immigrants who are worse off in Q_2 than they could be in Q_1 (id est: $I_F^1 < I_F^0$).⁴ It is important to note, that since each of the parties considered can easily identify the group responsible for the decline in economic welfare, it may well be that social conflicts will lead to additional welfare losses, so that the two groups will eventually realise third best welfare levels, e.g. I_i^3 and I_F^3 .

² The curves imply that native residents prefer to consume relatively more N goods as opposed to immigrants.

One may also consider in this context that the choice on N goods is basically a collective one - in contrast to the choice on private goods which is made individually. The result of collective decision making applies to all, native residents and immigrants. Things being as they are, immigrants do not have the right to vote until they receive, after due assimilation, citizenship. If they have the right to vote, their influence on the structure of production will still be uncertain, because majority voting rules do not produce consistent outcomes under conditions of diverse preferences.

³ More precisely, Q_1 indicates what immigrants would have preferred had they actually been receiving the average citizen's income.

⁴ It may be argued that this Q_2 situation is easier for immigrants from less developed countries to cope with because their initial situation was much worse than any Q_2 situation could possibly be.

In the second case - hypothesising that preferences of immigrants and native residents are identical and are represented by the system of I_1 - the original optimum of Q_0 will be maintained. The welfare function I_1^0 will also include immigrants, and the production possibility curve (PC) will - by definition - not be changed. The income would simply be shared by a larger number of people. In other words, per capita incomes of native residents would decline.

Chapter II - Immigration Under Changing Conditions of Production

1. The basic model

Under conditions of free (labour) markets immigration changes the endowment of a country with productive factors towards a relative abundance of labour. *Ceteris paribus* one would expect a tendency for wage costs to decline in comparison to the costs of capital.

The effects of a significant inflow of labour on the allocation of resources, on relative prices, and on the structure of incentives will be analysed here in analogy to the booming-sector model of Corden (1984) and of Corden and Neary (1982). The model presupposes a small open economy and operates with two kinds of goods, namely those goods where world markets have a major influence (T goods again) and those goods, whose prices depend mainly on internal market conditions (N goods). For the sake of convenience N goods are again interpreted to be public goods and services which are not traded internationally, whereas the T goods are of the private kind and tradable.

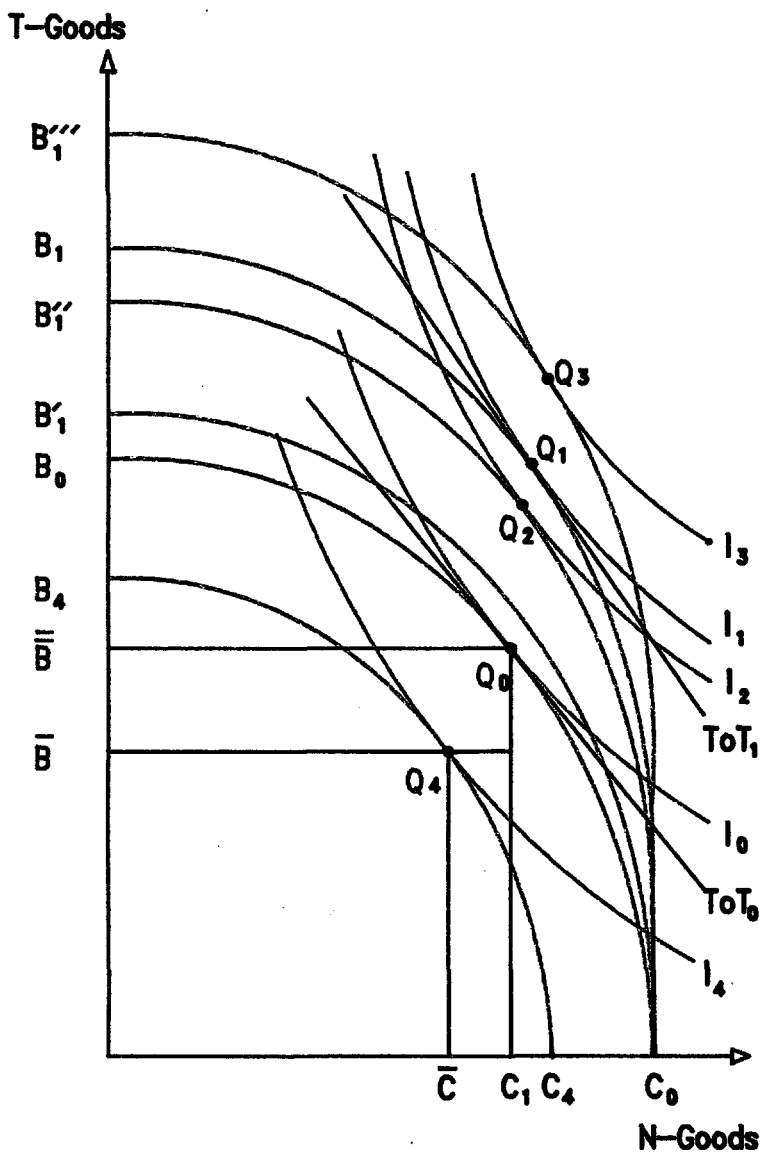
2. Immigrant and domestic labour as perfect substitutes

As a first approximation it will be assumed that immigrant labour is technically a close substitute to domestic labour, but that it will only be employed in the T goods sector⁵. Domestic factors of production are mobile between the two sectors; thus, the allocation of indigenous labour is affected by the inflow of foreign labour. Graph 2 represents basically the same model as graph 1 does, but now immigrant labour adds to the labour force in such a way that production of T goods

⁵ This bias in employment may be caused by a lack of proficiency in the language of the immigrant country, or by restrictions on the employment of immigrants in the public sector. For example, German citizenship is required to become a civil servant in Germany.

Graph 2 -

Immigration under Changing Production Conditions



expands from B_0 to B_1 . The aggregate indifference curve compatible with the new production function is I_1 instead of I_0 . The structure of production is described by Q_1 instead of Q_0 .

Most probably, the level of N goods production will increase because the terms of trade of N goods rise; as a matter of fact absolute prices for N goods rise, too, because prices of T goods are still determined by the world market. Maintaining the assumption that N goods are to a large extent public goods characterised by non-rivalry in consumption the negligible effect of immigration on the supply of N goods, as depicted in graph 2, is indeed plausible.

The final outcome of this exercise seems to be that the economy as a whole is better off after immigration than before: native residents are not worse off with respect to public goods, and the production of T goods is higher. However, total production (Q_1) is now shared by native residents and immigrants. I_1 is not necessarily representing a higher level of welfare of the native residents because it also represents the immigrants' preferences (for which Arrow-additivity⁶ is assumed here). In other words, per capita welfare of native residents may decline.⁷

3. Immigrant and domestic labour as imperfect substitutes

⁶ Arrow (1951) found it logically impossible to construct a social welfare function given conditions of separate preferences. In the previous chapter II we did not deal with Arrow's impossibility theorem because of the explicit introduction of divergent utility functions. It may be added that the influx of people being fundamentally different from native residents creates the very inconsistencies in the outcome of political processes which Arrow's impossibility theorem hypothesises. In other words, the "brave old world" of social consensus and accountability is endangered.

⁷ The policy issue here is whether the total-utility concept of a Benthamite social-welfare function is valid, or whether the concept of a Millian social-welfare function (maximising average utility) is preferred (Quibria 1990). We feel that the average citizen of today would find the Benthamite approach to be too nationalist.

a. The multicultural variant

Immigrants normally bring along the knowledge, the traditions, and the production techniques of their home countries and, thereby, enhance the availability of goods and services, and add to the culture of the host country (Sowell 1981).

Non-substitutability of the factors of production comes in two variants. The first will be called south-north migration (=SNM) and the second will be called north-north migration (=NNM). The SNM variant is characterised by immigration of labour which is on average less productive than domestic labour and/or produces T goods which are on average in the lower-priced segments. In other words, it is assumed that wages and, correspondingly, marginal products are lower when compared to domestic labour. On the other hand, in the NNM variant immigrant labour is supposed to be equally or even more productive than domestic labour.

The SNM case is characterised both by new kinds of T goods supplied domestically and/or by a lower marginal productivity of labour in producing the "old" domestic T goods. In order to keep the analysis simple the production of new and cheap T-goods may also be translated into a below-average labour productivity of immigrants. In graph 2, the hypothetical case of immigrants producing T goods with domestic productivity would shift the production-possibility curve from B_0C_0 to B_1C_0 . The actual lower productivity of immigrants, however, leads to a rise of the production potential of T goods from B_0 to B_1 only. The equilibrium point of production would then be Q_2 , where the relative price of T goods is lower than in Q_0 but higher than in Q_1 . Given

the above assumptions, per-capita welfare would be lower than in Q_0 or in Q_1 .⁸

In the NNM case immigrant labour is supposed to be more productive than domestic labour. Immigration will shift the society's welfare to I_3 (with the structure of production and consumption defined by Q_3), which is tantamount to an increase in per-capita income because additional domestic labour of the same amount would only lead to an increase in national welfare from I_0 to I_1 .

b. The unproductive immigrant

Under the condition of a basic human right to cross borders in every direction people may change their location simply on the ground that they prefer the endowment of a country with natural resources or with an infrastructure superior to that of their home country. If all immigrants are - for whatever reason - economically unproductive, the short-run equilibrium point will stay in Q_0 (still graph 2). However, domestic labour will have to share its income with immigrants. For example, native residents would have to pass on $(B_0 - B_4)$ or $(C_0 - C_4)$ of T goods, or N goods respectively, to the immigrants. The absorption possibility curve of domestic citizens would thus decline from B_0C_0 to B_4C_4 . Still referring to graph 2, production will stay at Q_0 whereas the new point of domestic citizens' consumption will shift to Q_4 . Id est, consumption of $(\bar{B} - \bar{B}_4)$ T goods or of $(\bar{C} - \bar{C}_4)$ N goods will be taken over by immigrants. In analogy to the Corden-Neary model this result resembles a net outflow of resources (capital, labour, or natural resources) for which the country of origin receives no equivalent return.

⁸ This conclusion holds for a remuneration of labour according to its marginal product only. The case of imperfect labour markets is discussed in chapter 3.2 below.

Chapter III - Microeconomics of Migration

1. The traditional market model

The traditional neo-classical market model with no externalities and non-distorted incentive structures provides a straightforward approach for analysing immigration.

Graph 3 represents the ordinary labour market equilibrium of the domestic economy in the sector of the (internationally) traded T-goods production.⁹ In this economy SS' describes the domestic supply of labour; supply rises with the wage rate until E_f , where the total domestic labour potential is absorbed ("full employment"). DD' represents the firms' demand for labour, reflecting their marginal productivity of labour as derived from the production function. In the absence of migration labour-market equilibrium will be at the full-employment level and at the wage rate w_f . After opening the domestic labour market for a free inflow of labour the new equilibrium will be at $(E_{\max}; w_1)$, given that in the small-economy case the supply of foreign labour can be described by an infinitely elastic supply curve $(FS)(FS)'$. Domestic labour will lose on two grounds: Its wage rate declines from w_f to w_1 , and its employment declines from E_f to E_1 . The amount of immigrant labour would be $(E_{\max} - E_{dom})$.

What are the welfare effects of an opening of the economy for foreign labour? The traditional Hicksian calculus would suggest that, while domestic labour will lose

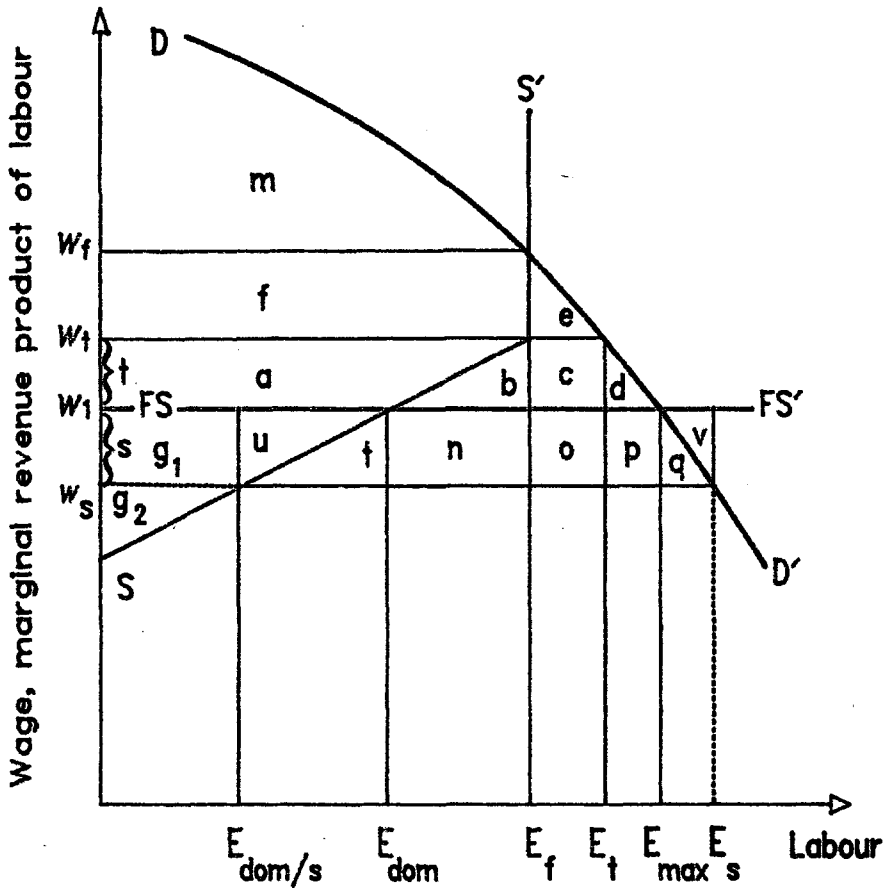
$$(1) \Delta L_{dom} = -a - f,$$

domestic producers would gain

⁹ This implies that the price of T goods is determined by the world market.

Graph 3 -

Immigration and Immigration Policies



$$(2) \Delta P = a + b + c + d + e + f.$$

Foreign labour, in this model, is not supposed to profit because perfect competition ensures that the international wage rate just compensates for the displeasures incurred by work and migration.

Thereby, the change in total domestic economic welfare is defined by:

$$(3) \Delta W_{dom} = b + c + d + e.$$

This outcome at the same time represents the change in world welfare due to the liberalisation of the national labour market.

2. Approximations to the real world

The above applied neo-classical paradigm is an oversimplification. In the real world, basic assumptions of the neo-classical model do not hold. In order to arrive at what the old Greeks called a *θεωρημα*, i.e. a condensed form of reality, the model has to be adjusted for facts which are obvious and seem to be crucial for assessing the impact of migration today. In reality, there is neither a completely closed national labour-shop system nor a completely free immigration system. In addition, distortions of incentive structures on labour markets are the rule rather than the exception; domestic and foreign labour are non-perfect substitutes; governments interfere with migration in many ways; the average immigrant has preferences which are often quite different from the ones of the average native resident; last but by no means least, the national welfare function may contain strains on the natural resource base as an argument, most of all in regions which are already densely populated.

In the following paragraphs we shall try to capture some of these factors by modifying the neo-classical model.

a. Partial discrimination of immigrants

In order to regulate immigration, governments have applied a multitude of measures. Among these are quantitative restrictions such as prohibition of immigration, e.g. in the case of Mexicans entering the United States of America, or legal provisions preventing immigrants from applying for work, e.g. in the case of Germany; or legal provisions allowing only those foreign applicants to immigrate who are supposed to have scarce skills, e.g. in the case of Australia. At the same time there is also the phenomenon of subsidisation of immigration in all those cases where immigrants receive social welfare payments or benefit from the material infrastructure of the immigrant country.

In paragraphs α and β we shall focus on two stylised variants of negative and positive discrimination of immigrants.

α . Restrictive immigration policy

We assume here that the domestic government imposes a tax (t) on immigrant labour; the case of a purely quantitative restriction can be inferred from this tax model. Still in graph 3, the tax on the immigrant wage rate raises domestic wages from w_1 to w_2 . Immigration is thereby reduced to $(E_i - E_f)$. Domestic employment will rise from E_{dom} to E_f , that is up to the full employment level for domestic labour. The labour market equilibrium without immigration policy was $(E_{max}; w_1)$. The equilibrium with immigration policy is $(E_i; w_2)$. The welfare effects of this policy are:

$$(4) \Delta P = -a - b - c - d,$$

$$(5) \Delta L_{dom} = +a,$$

$$(6) \Delta G = +c,$$

where ΔG refers to the change in government revenues.

The change in total domestic economic welfare thus amounts to

$$(7) \Delta W_{dom} = -b - d,$$

which also represents the change in world welfare.¹⁰

Comparing (7) with (3) reveals that the described immigration policy, although welfare decreasing with respect to no immigration policy, is superior to the situation of no immigration at all (by the amount of $c + e$).

As regards an immigration policy employing quantitative restrictions instead of taxes, the results change only slightly. In case no domestic citizen or institution profits from the rents provided by the quota,

$$(8) \Delta G = 0$$

and

$$(9) \Delta W_{dom} = -b - c - d.$$

Thereby, welfare declines more on account of the quota rent than in the immigration-tax case.

β. Expansive immigration policy

History offers many examples of immigration policies which aim at a positive discrimination of immigrants. In the following the effects of an immigration wage subsidy, which is de facto the mirror image of the above discussed immigration tax model, is analysed. Graph 3 also exemplifies the results of an immigration subsidy:

¹⁰ It is interesting to note that immigrants contribute to national welfare by the amount of area c (not included in the analysis of welfare changes because c represents no change); domestic labour contributes to national welfare the equivalent of the areas $(m + f)$.

In comparison to a situation of a free immigration [defined by $(E_{\max}; w_1)$] the new equilibrium is $(E_s; w_s)$.

From this it follows that

$$(10) \Delta P = g_1 + u + r + n + o + p + q,$$

$$(11) \Delta L_{dom} = -g_1 - u.$$

Foreign labour is still subject to the above mentioned "displeasures of migration and work" equivalent to w_1 . Competition among immigrants ensures that the wage level w_1 drops by the amount of the immigration-subsidy rate, s , to w_s :

$$(12) \Delta G = -u - r - n - o - p - q - v,$$

$$(13) \Delta W_{dom} = -u - v.$$

This result is similar to the result of an immigration tax.¹¹

γ. Conclusions

With hindsight, the results on positively or negatively discriminating migration policies are not surprising: Any migration policy reduces welfare, no matter whether it taxes or subsidises immigration. Similar to analyses of national or international trade policies the first best policy is not to interfere with the free movement of labour (or goods), at least in the absence of externalities and regulated markets, and of heterogeneity of skills and of consumers' preferences.

b. Immigrants and regulated labour markets

α. The case of the highly productive immigrant

History offers many examples of countries losing some of their scarce and highly productive labour force, such

¹¹ In a completely linear world welfare losses $(b + d)$ are equal to $(u + v)$.

as Germany in the wake of World War II, or Sweden during its high taxation decades in the second half of the 20th Century. On the other hand there are at the same time countries which select from the supply of immigrants those who are supposed to be highly productive. The method of "picking the winners" may vary between the American way (such as the "Operation Paperclip") and the Australian approach (where immigrants have to meet certain skill requirements).¹²

In Graph 4a we present the model for analysing the case of highly productive immigrants entering a country with a regulated labour market. Wages are fixed at level w_r leading to domestic employment of E_f . $E_f - E_r$ of the domestic labour force is unemployed on account of the wage regulation. Foreigners applying for immigration are supposed to produce at a level of marginal productivity of MP_F . For reasons of simplicity it is assumed that the opportunity wage of immigrants is w_f , i.e. the domestic full employment wage in the absence of regulations. The highly productive immigrants receive the fixed wage w_r . In view of their marginal productivity this would be equivalent to a subsidy for domestic producers of the amount of $(MP_F - w_r)$. Immigrants thereby receive an "effective wage" of w_r^{eff} . At their effective wage the firms employ $(E_F - E_{dom})$ foreigners. Domestic employment is reduced from E_f to E_{dom} (at E_{dom} domestic labour has a marginal product of MP_F , too). The welfare effects of immigration in this case are:

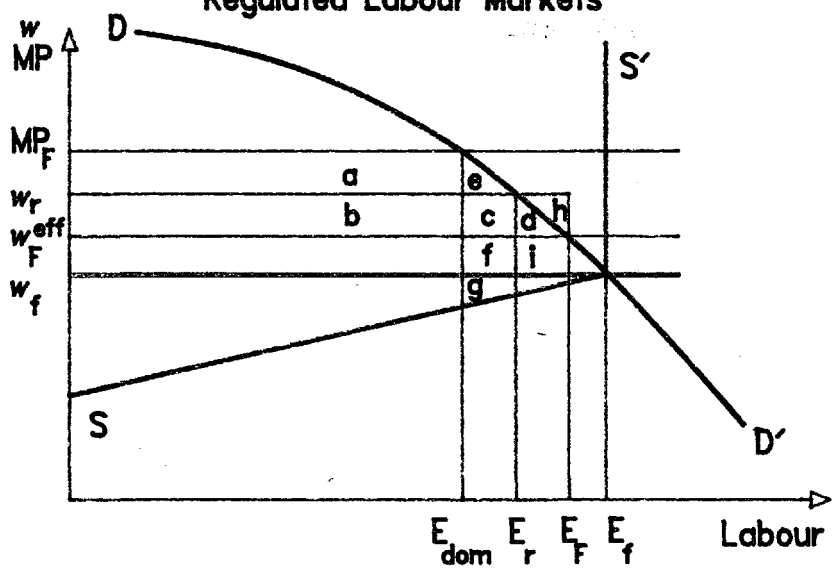
$$(14) \Delta P = (c + d),$$

$$(15) \Delta L_{dom} = -c - f - g,$$

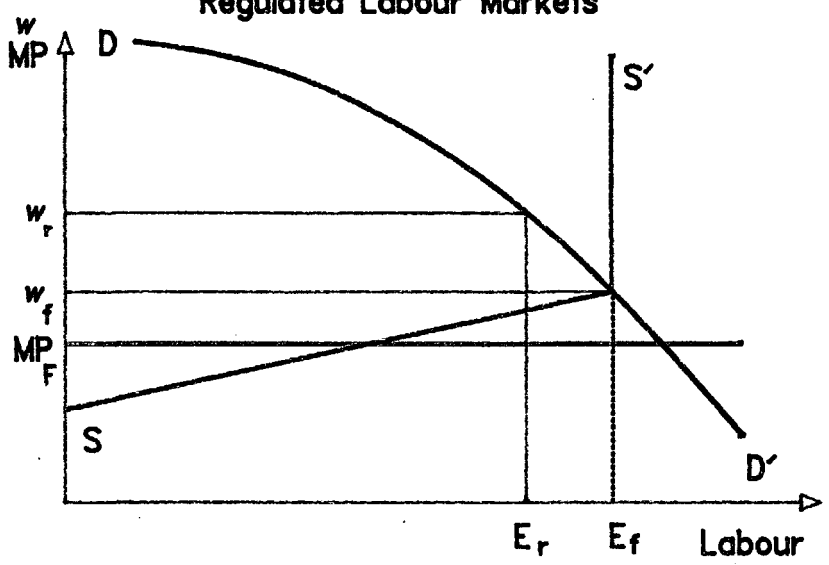
¹² At a first glance immigration into the Americas in the wake of Columbus or others is of the same highly productive nature. It should be reminded, however, that the American native residents (i. e. the Red Indians) of that time did not pursue any policy of picking the winners. In fact, they do not seem to have profited at all due to the ensuing dramatic changes in the natural resource base.

Graph 4 --

a) The Case of High-Productivity Immigrants and Regulated Labour Markets



b) The Case of Low-Productivity Immigrants and Regulated Labour Markets



$$(16) \Delta L_F = c + d + f + h + i,$$

From this follows a change in domestic welfare of native residents

$$(17a) \Delta W_n = d - f - g,$$

which should be negative in most instances. Calculating the welfare change of total domestic residents, native and foreign, leads to

$$(17b) \Delta W_v = c + 2d + i + h - g,$$

which should be positive in most instances. In other words: immigrant supply of highly productive labour on regulated labour markets raises the welfare of immigrants the most, whereas the native labour force loses income.

β. The case of the low-productivity immigrant

This case is described by graph 4b. MP_F is below the fixed minimum wage level. Consequently, immigrant labour, being less productive, will find no job at the regulated wage w_r . This seems to contradict the empirical fact of mass immigration from less developed into highly-developed economies,¹³ such as the US. or Germany. In the case of the US., however, labour markets are not as heavily regulated; moreover, a large part of immigration is illegal, as is employing illegal immigrants. As regards Germany, the analysis does not help to account for mass immigration (cf. p. 15 f.), but it may serve to explain why German trade unions never actually have opposed immigration (instead, they have demanded that foreign labour should not be discriminated against and receive the negotiated wage rate). Part of the immigrants from low productivity countries is not

¹³ Immigrants from LDCs can be supposed to have a productivity which is close to the average labour productivity in their home country.

allowed to work in these countries anyway, and part joins the - illegal - black-labour market.

γ. Conclusions

The analysis has shown that even in the case of regulated labour markets the native workers tend to lose when foreign labour immigrates, be it more or be it less productive than native labour.

c. The case of an over-exploitation of the resource base

α. The natural resource base

The technical and economic characteristics of natural resources are manifold. Natural renewable or non-renewable resources owned by native residents and, therefore, priced adequately, will experience a price increase concomitant with a decreasing endowment per head due to the population growth caused by immigration. Price increases per se are not welfare-relevant. Quite another issue is the case of those natural resources owned by the state that - for technical reasons or due to policy failure - are not adequately priced. A main feature of these natural resources of a country is that they are of the common-pool kind. Up to a certain level, additional exploitation has no negative consequences ("externalities") for further exploitation. Beyond that level additional use of the resource raises private costs and, more importantly, social costs of additional exploitation, present or future. Availability of (national) natural common-pool resources is different among countries, depending, among others, on the stage of economic development, on the degree of homogeneity of the population, or on the density of population. In certain countries, such as Australia with a vast resource base, immigrant labour may in fact increase the social product by more than the immigrants' own incomes. Other and more crowded countries, such as Hong Kong, may feel detrimental effects of immigration on society's

welfare. From this reasoning it follows that there exist optima of population. Population growth beyond the optimum level would reduce welfare.

Graph 5 describes a stylised case of over-exploitation of the natural resource base induced by immigration. The domestic equilibrium is the same as in those graphs above which referred to unregulated labour markets. Immigrant labour can be hired at marginal costs of $MC_{F,pr}$ (= private marginal costs of foreign labour). Over-exploitation of the natural resource base (in the absence of an appropriate pricing of resource use) can be interpreted as a cost to society arising in addition to what private firms have to pay to foreign and domestic labour. With a grain of salt¹⁴ this can be illustrated by a social supply curve of $MC_{F,soc}$, which is above the private supply curve of foreign labour.

The algebra of graph 5 is the following: Resource costs of immigration are equivalent to the areas $f+b+c+g+d+e$, since $(E_{equ,pr} - E_{dom,pr})$ immigrants cause social costs of t per capita. Government can improve the situation by raising a tax of $t = (MC_{F,soc} - MC_{F,pr})$, thereby raising domestic employment to $E_{dom,soc}$ and decreasing immigration to $(E_{equ,soc} - E_{dom,soc})$. The welfare calculus is the following:

$$(18) \Delta P = -a - f - b - c - d - e,$$

$$(19) \Delta L_{dom} = a + f.$$

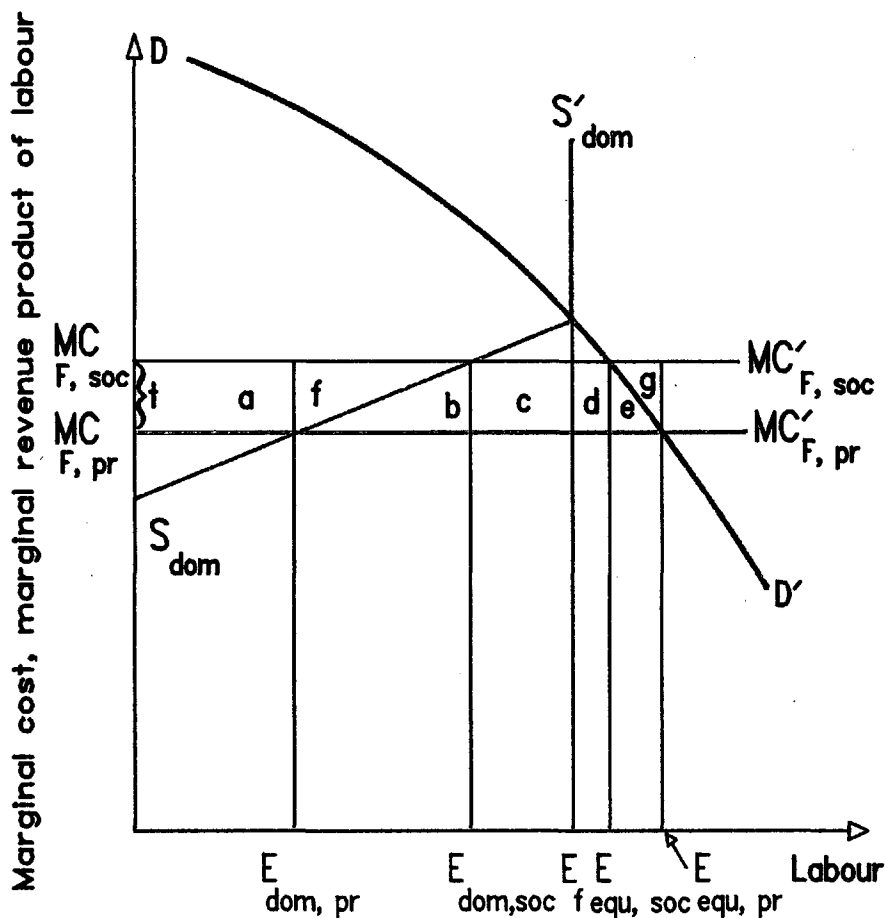
Resource savings are

$$(20) \Delta RS = f + b + e + g,$$

¹⁴ It is assumed here that (1.) the labour participation rate is constant and the same for all situations and for native residents and foreigners, (2.) the strategic variable is immigration; this is close to reality because constitutions normally provide the right of citizenship to native residents only; (3.) resource costs per immigrant are constant.

Graph 5 -

Immigration and the Resource Base



and

$$(21) \Delta G \approx c + d.$$

Total domestic welfare is increased by the amount of $(f+g)$ due to the tax on immigration.

β. The material infrastructure

It is often argued that immigration puts a strain on the domestic material infrastructure because of the induced need for additional schools, hospitals, streets, police etc. These arguments are partly of a short-run nature; in the longer run the infrastructure will adjust to the additional requirements - i.e. if all things are equal the shares of immigrants' incomes devoted to the national infrastructure will be the same as it had been before (and still will be) for the native residents alone.

Things are different in all those cases where immigrants absorb a higher share of the infrastructure than native residents. For example, it has been argued that the crime rate of immigrants with respect to major offences against the law is patently higher than the crime rate of native residents (Neu 1984). At a first glance, the latter phenomenon seems to be a case of social costs of immigration exceeding private costs, as depicted in graph 5. Again, the policy solution in order to avoid welfare losses would be a tax on immigration rather than raising taxes both on native residents and on immigrants. The obvious difference between the two cases is, that natural resources are exhaustible and the infrastructure is not. This difference is important: In the case of deplorable natural resources immigrants do not automatically pay for the resource cost of immigration. In the case of a renewable infrastructure general taxes levied on all employees would provide for the supply of the additional infrastructure, implying a permanent decline in disposable per-capita incomes.

Chapter IV - Conclusions

In a truly neo-classical world, with no substantial differences between immigrants and native residents, free migration is welfare increasing for the native residents of the immigrant country. In contrast to this ideal world the real world is more complex. Our findings suggest that in the real world, in order to exploit positive welfare effects accruing to an economy which opens its labour markets to foreign labour, interventions are necessary.

It is noteworthy that the analysis indicates that subsidies on immigration are generally not warranted and that, on the other hand, the immigration-tax case is easier to substantiate in the case of bottlenecks of the natural or material infrastructure. Anyway, the design of an interventionist policy would have to take into account the degree of homogeneity of preference patterns, the changes in the domestic production patterns, the degree of substitutability of domestic labour for foreign labour, the labour-participation rate, the existence of regulated labour markets, and the availability of natural resources. To be sure, there may be intrinsic information problems coming up which make consistent immigration policies impossible. Given that superior knowledge in these matters is non-existent a viable solution may be gained by asking the constituency on the optimal size of population.

It is important to note that our analysis is of the comparative-static kind. The effect(s) of immigrant labour on economic growth and on structural change at large may be more important than the static effects alone. As to the growth effects of immigration, analysts seem to come up with divergent results. Whereas Johnson (1993) attributes positive growth effects to immigration into the United States, Galor/Stark (1993) seem to suggest negative growth effects on account of a decline in the endowment with human capital per capita. Indeed, it may be argued that any inflow of low-skilled labour into highly-developed countries lowers - along with a decrease of labour

productivity - the incentives for capital deepening as well as for introducing new technologies. Japan may serve as an example here: What kind of immigration policies have been pursued in a country producing at the high-technology frontier for so many years?

Literature

- Arrow, Kenneth, *Social Choice and Individual Values*, New York 1951.
- Basu, Barati, *International Migration and Welfare in the Presence of Non-traded Goods: An interconnected Markets Approach*. In: *International Economic Journal*, Vol. 6, 1992(4), pp. 33-45..
- Bhagwati, Jagdish N., *Incentives and Disincentives: International Migration*. In: Bela Balassa, Herbert Giersch (eds.), *Economic Incentives*, Hampshire and London 1986, pp. 89-111.
- Burda, Michael, *The Determinants of East-West German Migration: Some First Results*. In: *European Economic Review*, Vol. 37, Nos. 2/3, April 1993, pp. 452-462.
- Chakravarti, Bhaskar Dutta, *Migration and Welfare*. In: *European Journal of Political Economy*, Vol. 6, 1990, pp. 119-138.
- Corden, Warner Max, *Booming Sector and Dutch Disease Economics: Survey and Consolidation*. In: *Oxford Economic Papers*, Vol. 36, 1984, pp. 359-380.
- , J. Peter Neary, *Booming Sector and De-Industrialisation in a Small Open Economy*. In: *The Economic Journal*, Vol. 92, 1982, pp. 825-848.
- Ernst, Andrea, *Sozialstaat Österreich, bei Bedarf geschlossen*. Wien 1987.
- Faini, Ricardo, Allesandra Venturini, *Trade, Aid and Migrations. Some Basic Policy Issues*. In: *European Economic Review*, Vol. 37, Nos. 2/3, April 1993, pp. 435-442.
- Freeman, Richard, *Immigration from Poor to Wealthy Countries: Experience of the United States*. In: *European Economic Review*, Vol. 37, Nos. 2/3, April 1993, pp. 443-451.

- Galor, Oded, Oded Stark, Migration, Welfare and Growth. Paper delivered at the conference "Migration - A Challenge for Europe", Institut für Weltwirtschaft Kiel, June 1993.
- Gupta, Manash Ranjan, International Migration and Welfare: A Note. In: Keio Economic Studies 124, Vol. 28, 1991 (2), pp. 45-51.
- Johnson, Janis, Einwanderung als Antriebskraft für die amerikanische Wirtschaft. In: US. Information Service, Embassy of the United States of America, Amerika Dienst 23, 9. Juni 1993.
- Moffit, Robert, Incentive Effects of the US Welfare System: A Review. In: The Journal of Economic Literature, Vol. 30, 1992 (1), pp. 1-61.
- Neu, Axel D., Entwicklungstendenzen auf dem Arbeitsmarkt und ihre Auswirkungen auf die Jugendkriminalität. Kriminologische Schriftenreihe, Band 86. Heidelberg 1984.
- Quibria, M.T., On International Migration and the Social Welfare Function. In: Bulletin of Economic Research. Vol. 42, 1990 (2), pp. 141-153.
- Schatz, Klaus-Werner, Comment. In: Bela Balassa, Herbert Giersch (eds.), Economic Incentives, Hampshire and London 1986, pp. 112-117.
- Sowell, Thomas, Ethnic America. A History. New York 1981