Meckl, Jürgen

Working Paper

Migration, income redistribution, and international capital mobility

Diskussionsbeiträge - Serie II, No. 230

Provided in Cooperation with:
Department of Economics, University of Konstanz

Suggested Citation: Meckl, Jürgen (1994) : Migration, income redistribution, and international capital mobility, Diskussionsbeiträge - Serie II, No. 230, Universität Konstanz, Sonderforschungsbereich 178 - Internationalisierung der Wirtschaft, Konstanz

This Version is available at:
https://hdl.handle.net/10419/101727

Sonderforschungsbereich 178
„Internationalisierung der Wirtschaft“

Diskussionsbeiträge

Juristische
Fakultät

Fakultät für Wirtschafts-
wissenschaften und Statistik

Jürgen Meckl

Migration, Income Redistribution, and International Capital Mobility

---

Postfach 5560
D-78434 Konstanz

Serie II — Nr. 230
Juli 1994

Migration, Income Redistribution, and International Capital Mobility

Jürgen Meckl

Serie II - Nr. 230

Juli 1994

Migration, Income Redistribution, and International Capital Mobility

Jürgen Meckl
University of Konstanz/SFB 178*

June 27, 1994

Abstract

This paper studies income–redistribution effects from labor migration in a small open economy under alternative assumptions on the international mobility of capital. Our principal result is that induced international capital flows dampen or may even reverse redistribution effects. However, as long as the location of capital is unaffected by migration redistribution effects may be greater if some of the capital is foreign owned, depending on whether labor and capital are friends or enemies. Only then *national* redistribution of income is accompanied by *international* redistribution effects.

Keywords: factor mobility, income distribution, international trade.

*I am indebted to Max Albert, Nadine Leiner, Günther Schulze, and Alan Woodland for valuable hints and comments. Financial support from the "Deutsche Forschungsgemeinschaft" is gratefully acknowledged.

1 Introduction

The threat of mass immigration of unskilled workers has triggered an intense debate about the appropriate immigration policy in the potential host countries. In the center of the political discussion is the question whether migration has an undesired impact on the income distribution of nonmigrants. This debate is most noticable in the highly industrialized countries of the European Union (especially in Germany), which face a huge immigration potential not only from Eastern Europe (due to the removal of emigration barriers), but also from membership expansion, and from the less developed countries within the Union (e.g. Portugal and Greece). Similarly, the US is confronted with immigration, mainly from Mexico. On the other hand, the source countries face symmetric problems.

Conventional wisdom seems to suggest that immigration shifts income distribution against the immigrating factor labor and favors capital. This common belief stands in sharp contrast to the presumption from standard trade theory that migration may actually have no effect on the distribution of income at all (cf. Kenen 1971, Rivera–Batiz 1983). This result is derived from rather special models (low dimensionality, restrictive assumptions on technologies), and as Rivera–Batiz (1983) and Davies and Wooton (1993) have shown, breaks down if the number of factors exceeds the number of goods. Furthermore, these models assume that labor is the only internationally mobile factor.

In the real world, however, we observe international movements not only of labor but also of some other factors of production, especially capital. Grossman (1984), Svensson (1984), Neary (1985), and Ethier and Svensson (1986) discuss rather general models, where some factors are internationally mobile. However, these papers provide no means to analyze the distributional impacts of migration since they assume that all individuals have identical vectors of factor endowments. Furthermore, they assume that factor owners always remain in their home countries. They do not take into account the major difference between labor migration and international capital movements: migrating individuals move from one country to another taking with them at least their endowment of labor and consume in the host country, whereas capital owners typically remain in their home countries. Hence the relationship between migration and capital movements cannot be adequatly analyzed in these models.

The present paper tries to bring these two strands of the literature together:

we analyze the income–redistribution effects of migration under alternative assumptions concerning the international mobility of capital. We show that redistribution effects in general are smaller or may even be reversed if capital is internationally mobile instead of being immobile *and* completely owned by domestic residents. In both cases income redistribution is restricted to *national* groups of factor owners only. By contrast, if capital is immobile internationally but a portion of it is foreign–owned, migration may strengthen redistribution effects whenever there is an *international* redistribution in favor of the home country.

The paper is organized as follows. In Section 2, we explain the analytical framework and derive the redistribution effects when capital endowments are given exogenously and internationally immobile. In Section 3, we introduce a simple form of capital mobility, where some portion of the exogenously given capital stock used in the economy is foreign–owned. In Section 4, we look at the case of perfect international capital mobility. We proof the conjecture of Rivera–Batiz (1983: 186) that induced capital movements work in favor of labor income, going beyond the framework he uses. Section 5 notes some applications of our results to issues in contemporary economic policy.

2 Migration with Domestic Capital Ownership

To examine the relation between income–redistribution effects of migration and the degree of capital market liberalization, we employ a standard model of a competitive small open economy with any number of goods and factors. We assume free trade in goods. Labor and capital (in Section 4) are internationally mobile factors, whereas the remaining factors are assumed to be internationally immobile. For simplicity's sake, we only make the factors labor and capital explicit. To keep the distribution problem as simple as possible we distinguish only two classes of factor owners. The population L of the economy consists of m persons endowed with one unit of labor (called laborers hereafter) and of $n \equiv L - m$ persons endowed with one unit of labor and identical endowments of all the remaining factors (called capitalists hereafter). Subsequently, we confine our analysis to migration of laborers.

First we consider the case where migration is the only feasible kind of international factor mobility. Capital used domestically (K) is given exogenously

and completely owned by domestic capitalists. The initial equilibrium for the economy may be described by the budget constraints of laborers and capitalists:

$$m \cdot u_m \cdot e(\mathbf{p}) = m \cdot w(\mathbf{p}, m, K) \quad (1)$$

$$n \cdot u_n \cdot e(\mathbf{p}) = y(\mathbf{p}, m, K) - m \cdot w(\mathbf{p}, m, K). \quad (2)$$

These two equations state that expenditure, expressed by a homothetic expenditure function defined over prices $\mathbf{p}$ and utility u, equals factor incomes. The factor income for a laborer is given by the wage function $w(\mathbf{p}, m, K)$, which is the partial derivative of the gross–domestic–product (GDP) function $y(\mathbf{p}, m, K)$ with respect to m. This GDP function gives the maximum value of output given a vector of goods' prices and a vector of factor supplies. We will assume this function to be convex in goods' prices, concave in factor supplies, and twice differentiable everywhere in its domain.[1] The factor income of capitalists is given by the difference of GDP and wages paid to laborers. Differences in the utility levels of the two classes of factor owners reflect income disparities. The price vector $\mathbf{p}$ is given exogenously for this small open economy.

The effect of migration on the welfare of laborers and capitalists can be obtained by differentiating (1) and (2) with respect to m:

$$m \cdot e(\mathbf{p}) \cdot du_m = m \cdot \frac{\partial w(\mathbf{p}, m, K)}{\partial m} \cdot dm \quad (3)$$

$$n \cdot e(\mathbf{p}) \cdot du_n = -m \cdot \frac{\partial w(\mathbf{p}, m, K)}{\partial m} \cdot dm \quad (4)$$

Since $\partial w(\mathbf{p}, m, K)/\partial m \leq 0$ with equality if factor prices are independent of factor endowments, i.e. if the number of goods or active processes (in the presence of joint production) is at least equal to the number of factors,[2] immigration

[1] Note that we assume that the production possibility set is convex and exhibits constant returns to scale, but place no other restrictions on the economy's technology; hence our results continue to hold in the presence of joint production and imperfect intersectoral mobility of factors.

[2] Trade theory refers to this situation as "local factor–price equalization property". This does not imply that factor prices necessarily are equal between the home country and the rest of the world: For that to be the case we must additionally assume equal technologies. However, none of our results requires this assumption. In general, local factor–price equalization implies that factor prices are locally independent from factor endowments. Formally this means that the matrix of the GDP functions second differentials with respect to flexible–price factor supplies is singular. We will refer to this property in the context of international capital mobility in Sec. 4.

(i.e. $dm > 0$) generates a redistribution of income between nonimmigrants from laborers to capitalists. However, aggregate welfare of nonimmigrants, which can be measured by the sum of their real incomes,[3] does not change.

There has been some controversy on this result in the literature.[4] Some authors claim that in a completely specialized economy with two factors migration does not change welfare of the domestic nonmigrants (cf. Grubel and Scott 1966, Berry and Soligo 1969, Bhagwati and Rodriguez 1975). This is true as long as individuals have identical factor endowments. However, this has been assumed not to be the case by these authors. As our analysis shows, their result only holds in so far as the *aggregate* welfare is concerned; but there is some redistribution between different classes of factor owners. By contrast, if factor prices are independent of factor endowments, migration does not change income distribution in a small open economy irrespective of individual endowments. Traditional trade theory has emphasized this result (cf. Kenen 1971: 246, Rivera–Batiz 1983: 184, Quibria 1990: 146).

3 Migration and Foreign–Owned Capital

Now, consider the case where some fixed portion of capital used domestically is foreign owned. Though capital is not *effectively* mobile, this state of affairs involves some kind of international capital mobility. This framework could probably be best interpreted as describing short–run adjustment to exogenous shocks occurring before international capital reallocation takes place.

Let $\widetilde{K}$ denote capital owned by domestic capitalists. The capitalists' budget constraint must then include factor payments to foreign capitalists:[5]

$$n \cdot u_n \cdot e(\mathbf{p}) = y(\mathbf{p}, m, K) - m \cdot w(\mathbf{p}, m, K) - r(\mathbf{p}, m, K) \cdot (K - \widetilde{K}). \qquad (5)$$

Laborers' budget constraint is unaffected by foreign ownership of capital: the welfare effect of migration does not change for this class of factor owners. Differentiating (5) with respect to m gives the following effect on the welfare of

[3]Due to our assumption of homothetic preferences we can define real income as an aggregate welfare measure for an economy, though individuals differ with respect to their factor endowments.

[4]Leiner and Meckl (1994) elaborate on this point in greater detail.

[5]We assume throughout that capital income accruing to foreigners is untaxed.

capitalists:

$$n \cdot e(\mathbf{p}) \cdot du_n = -\left[m \cdot \frac{\partial w(\mathbf{p}, m, K)}{\partial m} + (K - \widetilde{K}) \cdot \frac{\partial r(\mathbf{p}, m, K)}{\partial m}\right] \cdot dm \qquad (6)$$

As eq. (6) shows, foreign capital ownership induces an additional effect on the utility of capitalists as long as factor prices depend on factor endowments.[6] If the factors capital and labor are enemies as defined according to Ruffin (1984: 263), i.e. $\partial r(\mathbf{p}, m, K)/\partial m \leq 0$, both effects are nonnegative for capitalists in the case of immigration: capitalists gain from *national* and *international* redistribution of incomes. If capital and labor are friends, we have contrary national and international redistribution effects generating an ambiguous effect on capitalists' welfare.

Crucially, the existence of international redistribution effects depends on the fact that capital, though foreign-owned, is not effectively mobile internationally. A fall in capital rentals does not induce capital outflows but lessens the foreigners' capital income. Thus domestic capitalists gain since both the domestic laborers' and foreign capitalists' shares of domestic GDP decline. The aggregate welfare of domestic nonmigrants rises in that case. On the other hand, with increasing capital rentals the foreign capitalists' share of GDP also rises generating an ambiguous effect on income distribution; aggregate welfare of domestic nonmigrants declines. Comparing the income-redistribution effects of migration in a model where a portion of capital is foreign owned to one where capital is completely domestically owned, we can state the following proposition:

Proposition 1 *As long as the international location of capital is unaffected by migration, redistribution towards capitalists is higher when some of the capital is foreign owned and capital and labor are enemies. Redistribution is smaller or may be even reversed if capital and labor are friends. Additionally, migration has an impact on aggregate welfare of domestic nonmigrants in general.*

[6]Note that there will be no additional effect from international capital ownership if home capitalists own capital abroad. Since the foreign capital rental is given exogenously the change in capitalists' utilities is given by (4) in that case.

4 Migration and Perfect Capital Markets

In the last section we have shown that with foreign ownership of domestically used capital the friend–enemy relation between labor and capital plays a decisive role in determining redistribution effects of migration. The means through which this relation works is the change in domestic capital rentals induced by changes in domestic labor endowments. With capital being perfectly mobile internationally the, capital rental is exogenously determined for a small open economy. Though the friend–enemy relation cannot work via factor prices any more, it plays a role for endowment and output changes.

With perfect international capital mobility, the domestic usage of capital K is endogenously determined, not the capital rental. Capital owned by domestic residents $\widetilde{K}$ is still fixed; but domestic–owned capital need not be used entirely in the home country (i.e., K may be now less than $\widetilde{K}$). In addition, the domestic capital rental must be equal to the exogenously given rental rate $\bar{r}$

$$r(\mathbf{p}, m, K) = \bar{r}. \tag{7}$$

This equation can be interpreted as the capital market equilibrium condition. The budget constraints again are given by (1) and (5). The effects of migration can be determined by differentiating (1), (5) and (7).

The capital market equilibrium condition implies that migration induces an adjustment of domestically used capital of

$$dK = -\frac{\partial r(\mathbf{p}, m, K)/\partial m}{\partial r(\mathbf{p}, m, K)/\partial K} \cdot dm. \tag{8}$$

As eq. (8) shows, migration has an impact on the international allocation of capital as long as factor prices depend on factor endowments. For this to be the case we must have more flexible–price factors than goods or activities.[7] Immigration induces capital inflows (outflows) if labor and capital are friends (enemies) such that capital rentals do not change. Differentiating the budget constraints with respect to m and K, inserting (8), and making use of the fact that

$$\frac{\partial r(\mathbf{p}, m, K)}{\partial m} = \frac{\partial^2 y(\mathbf{p}, m, K)}{\partial m \partial K} = \frac{\partial w(\mathbf{p}, m, K)}{\partial K}$$

we get

[7] In our context this means that the matrix of the GDP function's second differentials with respect to all factors other than capital must be nonsingular. Cf. Neary (1985: 557) for further discussion.

$$m \cdot e(\mathbf{p}) \cdot du_m = m \cdot \left[\frac{\partial w(\mathbf{p}, m, K)}{\partial m} - \frac{(\partial w(\mathbf{p}, m, K)/\partial K)^2}{\partial r(\mathbf{p}, m, K)/\partial K} \right] \cdot dm \qquad (9)$$

$$n \cdot e(\mathbf{p}) \cdot du_n = -m \cdot \left[\frac{\partial w(\mathbf{p}, m, K)}{\partial m} - \frac{(\partial w(\mathbf{p}, m, K)/\partial K)^2}{\partial r(\mathbf{p}, m, K)/\partial K} \right] \cdot dm. \qquad (10)$$

First, note that with perfect international capital mobility there is again no international redistribution of incomes; thus aggregate welfare of domestic nonmigrants does not change. A comparison of (9) and (3) focusses attention on how induced capital adjustments affect the income–redistribution effects of migration. With capital mobility there is an additional indirect effect on wages stemming from the adjustment of capital endowments, which always works against the direct effect of a change in labor endowments on wages.[8] Our main result can be summarized by the following proposition:

Proposition 2 *Consider two otherwise identical economies: in one capital is internationally mobile and in the other capital is immobile and owned by domestic residents. As long as factor prices depend on factor endowments, the impact of migration on the distribution of income is always less and may even be reversed in the economy which has access to international capital markets. In neither country migration has an effect on the aggregate welfare of the domestic nonmigrants.*

A striking feature of our result is that the sign of capital adjustment, which depends on the friend–enemy relation between labor and capital, is completely irrelevant for redistribution effects. If labor and capital are friends, immigration induces capital inflows in order to keep the capital rental at the world level $\bar{r}$. These capital inflows in turn have a positive effect on the friend's factor price, the wage rate. By contrast, if labor and capital are enemies, immigration induces capital outflows that reduce the enemy's factor price, the wage rate. Hence the friend–enemy relation between labor and capital will affect the income–redistribution effects of migration only if capital stocks are fixed, but by some portion it is foreign–owned. This can be best interpreted as the very short run.

Our proposition also confirms the conjecture of Rivera–Batiz (1983). He argued that immigration of labor induces capital inflows that "would partially reverse the losses of labor" (p. 186). However, he derived this proposition analyzing

[8]There is some empirical evidence that the indirect effect does not fully compensate the direct effect of migration; cf. Grossman (1982), Greenwood and McDowell (1986), and Borjas (1987).

the migration of unskilled labor in a specific–factors model where capital is perfectly mobile both internationally and intersectorally. With exogenous goods' prices, however, in this model the prices of sector–specific factors (skilled and unskilled labor) are independent of factor endowments and migration has no effect on the distribution of income at all. The inflow of capital ensures that factor markets clear at the initial prices. Thus his conjecture cannot be derived from the model he uses, but goes beyond it.

5 Conclusions

In this paper, we have analyzed the implications of international capital mobility on the distributional impact of migration in a small open economy. In particular, we have proven that perfect international capital mobility dampens or may even reverse income–redistribution effects. Before international capital reallocation takes place, however, redistribution effects in a capital importing economy are greater (smaller) if a portion of the domestically used capital is foreign owned and capital and labor are friends (enemies). Only if the economy uses a fixed amount of foreign–owned capital the aggregate welfare of domestic nonmigrants does change. These results hold for rather general specifications of technology (allowing for joint production), general assumptions on the intersectoral mobility of factors, and irrespective of factor intensities.

Our results suggest that the need to restrict immigration in order to avoid unintended distributional impacts is less if capital is internationally mobile. The latter should be the case for the most of the potential host countries; these highly industrialized countries should have perfect access to international capital markets. Considering that, resentiments against immigration in these economies may be overstated. One qualification, however, seems to be necessary. Our results have been derived for an economy that is small on both world goods and capital markets. Countries like the US surely do not qualify for this assumption. For a complete analysis all prices and factor prices should be treated as endogenous variables. However, there is a strong presumption that our results should carry over qualitatively (cf. Leiner and Meckl 1994).

Another application of our analysis is to the contemporary debate on the phasing of factor–market liberalization in Eastern European countries. A direct

consequence of proposition 2 is that liberalization of international labor markets should go hand in hand with liberalization of capital markets in order to keep unintended redistribution effects small. By contrast, if redistribution of income towards laborers is intended—a policy aim which seems to be the more realistic one for East European or Latin American source countries—these countries should restrict international capital movements. Hence distributional arguments seem to justify the slow process of capital–market liberalization in these countries.

References

Berry, R.A. and R. Soligo (1969), Some Welfare Aspects of International Migration, *Journal of Political Economy* 77, 778–794.

Bhagwati, Jagdish N. and Carlos Rodriguez (1975), Welfare–Theoretical Analysis of the Brain Drain, *Journal of Development Economics* 18, 195–221.

Borjas, George (1987), Immigrants, Minorities, and Labor Market Competition, *Industrial and Labor Relations Review* 40, 382–392.

Davies, James B. and Ian Wooton (1993), Income Inequality and International Migration, *The Economic Journal* 102, 789–802.

Ethier, Wilfred J. and Lars E.O. Svensson (1986), The Theorems of International Trade with Factor Mobility, *Journal of International Economics* 20, 21–42.

Greenwood, Michael J. and John M. McDowell (1986), The Factor Market Consequences of U.S. Immigration, *Journal of Economic Literature* 24, 1738–1772.

Grossman, Jean B. (1982), The Substitutability of Natives and Immigrants in Production, *Review of Economics and Statistics* 54, 596–603.

Grossman, Gene M. (1984), The Gains from International Factor Mobility, *Journal of International Economics* 17, 73–83.

Grubel, H.B. and A.D. Scott (1966), The International Flow of Human Capital, *American Economic Review* 56, 268–274.

Jones, Ronald W. and Jose A. Scheinkman (1977), The Relevance of the Two-Sector Production Model in Trade Theory, *Journal of Political Economy* 85, 909–935.

Kenen, Peter B. (1971), Migration, the Terms–of–Trade and Economic Welfare in the Source Country, in: Bhagwati, Jagdish N. et al. (ed.): Trade, Balance of Payments and Growth, North–Holland: Amsterdam, 239–260.

Leiner, Nadine and Jürgen Meckl (1994), Internationale Migration und Einkommensverteilung—Eine Aussenhandelstheoretische Analyse, forthcoming in *Jahrbücher für Nationalökonomie und Statistik.*

Neary, J. Peter (1985), International Factor Mobility, Minimum Wage Rates, and Factor–Price Equalization: A Synthesis, *Quarterly Journal of Economics*, C(3), 551–570.

Quibria, M.G. (1990), On International Migration and the Social Welfare Function, *Bulletin of Economic Research* 42(2), 141–153.

Rivera–Batiz, Francisco L. (1983), Trade Theory, Distribution of Income, and Immigration, *American Economic Review/Papers and Proceedings* 73(2), 183–187.

Ruffin, Roy J. (1984), International Factor Movements, in: Jones, Ronald W. and Peter B. Kenen (eds.): Handbook of International Economics, North–Holland: Amsterdam.

Svensson, Lars E.O. (1984), Factor Trade and Goods Trade, *Journal of International Economics* 16, 364–378.