ZEW
Zentrum für Europäische Wirtschaftsforschung GmbH

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Universität Konstanz

Rechts-, Wirtschafts- und Verwaltungswissenschaftliche Sektion
Fachbereich Wirtschaftswissenschaften

Diskussionspapiere der DFG-Forschergruppe (Nr.: 3468269275):

Heterogene Arbeit: Positive und Normative Aspekte der Qualifikationsstruktur der Arbeit

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August 2007

Diskussionspapier Nr. 07/15
http://www.wiwi.uni-konstanz.de/forschergruppewiwi/

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Christian Lumpe

Justus-Liebig-University Gießen
Department of Economics
35394 Gießen
Germany

mail: christian.lumpe@wirtschaft.uni-giessen.de
phone: +49-641-9922113
fax: +49-641-9922119

Abstract:

In this survey, we compare the history and status of immigration of a traditional immigration county (the US) with the experiences of a new immigration country (Germany). This reveals differences in the immigration policy as in the immigration population in the respective countries. We resume the theoretical model implications which the existing immigration should have had on the labour market outcome of natives. This takes into account the differing labour market institutions in both countries. We conclude then with a summary on the controversial debate of the empirical studies if immigration is harmful to natives or not.

JEL Klassifikation : F22, J31
Schlüsselwörter : Immigration, Labour market
Download/Reference : http://www.wiwi.uni-konstanz.de/forschergruppewiwi/

The labour market impact of immigration: theory and evidence

Christian Lumpe*

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*Correspondence: Christian Lumpe, Justus-Liebig-University Gießen, Department of Economics, D–35394 Gießen, Germany; email: christian.lumpe@wirtschaft.uni-giessen.de. I thank Henrik Egbert, Jürgen Meckl and Benjamin Weigert for helpful comments. Financial support of the German Science Foundation (DFG: grant ME1962) is gratefully acknowledged.

1 Introduction

Immigration is one of the most heatedly debated issues in politics. The rising immigrant numbers and the resulting fear of the native population have led to more restrictive immigration policies in many industrialised countries. Most of the reservation of natives against immigration is based on economic – mostly distributional – arguments, e.g., the belief that immigrants will replace native workers which translates into higher native unemployment and/or lower wages. However, the theoretical and the empirical economic literature don't come to these clear results. In contrast, the economic literature on immigration concludes that immigration is maybe beneficial, harmful or it has no effect at all to the labour market prospects of natives. All depends on which theoretical model or empirical study you may think.[1]

To give an example for the different theoretical models and empirical studies outcome, we will compare in this survey two prototypes of immigration countries – the US and Germany – which are characterised by different immigration traditions and labour market institutions. The US (like Canada or Australia) is a traditional immigration country whereas for most European countries immigration is a rather new phenomenon. A further difference are the existing labour market institutions in both countries: US labour markets are typically thought as competitive while in Germany wage rigidities generated by, e.g., collective wage setting by unions, are important.

[1] Obviously, there are already several well known surveys of this literature as Greenwood and McDowell (1986); Borjas (1994); Friedberg and Hunt (1995); Zimmermann (1995); LaLonde and Topel (1996), which cover parts of this survey.

There are further important issues of the impact of immigration on native welfare which this survey does not cover. E.g., we are only concentrating on the effects of legal immigration. Taking into account illegal immigrants may generate more negative or positive effects of immigration on native welfare.[2] Another important strand of the literature focuses on the impact of immigration on the welfare system (taxes and pensions) and thus the provision and distribution of e.g., unemployment benefits as well as on the political decision making in the host country.[3] Furthermore there is rising literature in economics which concentrates on native attitudes towards immigrants.[4]

In section 2, we will summarise the stylised facts on immigration and provide a short history of immigration since the Second World War for both countries. The similarities of the US and Germany are the increased number of low skilled immigrants and the increased number of refugees. The differences are their recognition of the increasing immigrant flows and the different immigrant population concerning the educational attainment of immigrants. In both countries, immigrants have often higher unemployment rates, less education and earn lower wages. However, in the US, we find much more heterogeneity over education and labour market success in the immigrant population. In contrast, the German immigrant population does not show this bimodality because high skilled immigrants are more or less absent.

In section 3, we will give an overview on the theoretical explanations of the effects of mostly low skilled immigration on the labour market outcome of natives. We

[2]See Yoshida (2000) and Yoshida and Woodland (2005) for an overview.
[3]See Boeri et al. (2002), Razin and Sadka (2005) and Kemnitz (2006) for recent overviews.
[4]See Mayda (2006); O'Rourke and Sinnott (2006); Dustmann and Preston (2006) among others.

consider the different theoretical results of immigration on wages or employment of natives depending on either the existence of competitive or rigid labour markets in both closed and open economies. In closed economies and under competitive markets, immigration theory predicts an overall gain for natives from immigration. The same result holds if we open this kind of economy to international trade: immigration leads as international trade in goods to an overall gain. But long run international trade theories as well as labour markets including union behaviour or exogenous minimum wage legislation may reverse this result and lead to a none existing or even negative effect of immigration. Furthermore there has to be recognised large distributional effects which are from the theoretical viewpoint clear-cut. These effects are often more decisive for a certain immigration policy than the question on the overall gain or loss of immigration by a country. Thus the advice for politicians range from no migration at all, migration barriers, to wage subsidies to offset the negative effect to laissez-faire immigration. As the theorists are undecided, the empiricists may have a clearer answer.

Therefore, in section 4, the empirical literature on the labour market impact of immigrants is reviewed. Unfortunately, the empirical literature also argues on the effect of immigration, but this time on the distributional effects of immigration. As in the theoretical literature, it seems to be a question of the model used. Apparently, adherents of local labour market studies belief in the rather non-existing or quite modest effect whereas national labour market supporters see a clear negative effect. And most surprisingly, the newest studies even show a positive effect of immigration on native wages. Interestingly, most of the studies are concerned with the US labour market. For Germany far less studies exist

although the rather heated debates about this issue there.[5] Section 5 concludes.

2 A brief history and stylised facts

2.1 A brief history of US immigration

The history of immigration into the US is very well documented.[6] According to Clark et al. (2007) there are mainly two periods of immigration after 1945: before and after the *Amendments of 1965 to the Immigration and Nationality Act of 1952*. Before the Immigration Act, immigration was directed by quotas which preferred more or less European – especially British and German – immigrants.[7] After the abolition of these quotas, immigrants mostly came from three geographical areas: Asia, Latin America and Western Europe. However, besides the end of the quota system, American politicians still tried to foster immigration of Western Europeans by establishing family reunification as main source of immigration. They expected high chain migration induced by the existing large European immigrant communities. But instead of Western Europeans, Latin-American and Asian families used this tool to let immigrate their families. Therefore, the *Immigration Act of 1965* lead to a quite dramatic change in the source countries: the fraction of Western Europeans on the population of immigrants dropped by nearly 25 per cent which were gained by Asians, Caribbean and Mexicans. Several authors – e.g., Borjas (1994) – see this evolution as a reason for the declining human capital of immi-

[5] See Longhi et al. (2005) for an overview on the large cross-country and cross-study variance.
[6] See Hatton and Williamson (1998, 2005) among others.
[7] These quotas dated back to the *Immigration Act of 1921* and its *Amendment of 1924*.

grants. Furthermore, with this policy change, the proportion of the foreign-born population on the total population rose to about 8 per cent from about 5 per cent in the 1970s.[8]

A further important cut on the foreign-born population was the *Immigration Reform and Control Act (IRCA)* from 1986. Intending to dispose illegal immigration, all existing illegal immigrants fell under the offer of an amnesty, but new illegal immigration should be avoided by imposing penalties on employers.[9] The *Immigration Act of 1990* had no significant impact on the composition of the foreign-born population. The difference between the foreign-born population and recent immigration flows are depending on the different characteristics of the main source countries. The huge and steady inflow from Mexico significantly changes the assimilation process of immigrants (concerning, e.g., language proficiency). Another legal platform to enter the US is the *Refugee Act of 1980* which followed the *Refugee Act of 1952*. Under this law, all immigrants fearing persecution because of political, ethnic or religious reason are allowed to immigrate. Examples for large refugee inflows are the Mariel boat lift from Cuba, the subsequent immigration from Cuba and the boat people from Asia.

[8] Interestingly, this proportion of the foreign-born is still below the 15 per cent in the beginning of the 20th century.

[9] In fact, the IRCA didn't lead to any significant decrease in the number of illegal immigrants (cf. Orrenius and Zavodny, 2003). See Jasso et al. (2000) for the economic impact of the US immigration policy.

2.2 A brief history of German immigration

Since the Second World War, the German experiences with immigration can be divided into four periods:[10] The first period (1945 – early 1960s) was the war adjustment phase where about 12 million Germans left the former German territories in Eastern Europe. From 1950 to 1960, about 90 per cent of the population growth has been by refugees from Eastern Europe. Until the Berlin wall was erected in 1961, another important stream of immigrants (about 2.6 millions) came from the German Democratic Republic into the Federal Republic of Germany. Surprisingly, the huge immigration flows nearly had no negative effect on the labour market because the rapid growth of the economy (*Wirtschaftswunder*) absorbed the massive inflows. Due to their German ethnicity, this first wave of immigrants obviously differs in their possibility to a more or less easy integration from the following waves.

The second period (1960 – 1973) is made up by the so called guest-worker system. Germany introduced an open immigration policy with active recruitment of workers in South European and Mediterranean countries because of regional and sector-specific labour shortages of low skilled labour during the boom period. The ancestor of the following treaties was concluded with Italy in 1955 and involved the equality of treatment concerning wages and social insurance payments between immigrants and natives. Immigration was mainly seen as positive for the

[10] See Herbert (2001); Bauer et al. (2005) among others. The German historical development is often comparable to the immigration experience of the other European countries with only one difference: the immigration source has been the decolonisation which several European countries had to face (cf. Zimmermann, 1995). The overview concentrates exclusively on West Germany as East Germany have not had any significant immigration (cf. Herbert, 2001).

German economy which used immigration as mobility reserve of labour for peak times. By not prolonging labour permits in recessions, unemployment has been exported in the recessions of the early 70ies. The immigration figures rose steadily from 700.000 to 4.1 millions foreign-born workers until 1973. From the mid 1960s on, the residence time of immigrants increased significantly, the number of women and children grew and the employment rates therefore decreased steadily. Thereby, these waves of immigrants still constitute the composition of the German stock of immigrants today.

In the third period (1973 – 1989), after the first oil price shock and the starting recession, the recruitment and open immigration policy came to a hold. The German government followed three principles: cutting down the number of new immigrants, integration of the existing immigrants and promotion of return migration. This policy strengthened the compositional change of immigrant population: there were more children, women and older immigrants instead of the former young male guest workers. The unemployment rates now were above average, because immigrants were mostly low skilled and the low skilled intensive sectors were mainly hit by the recession (e.g., metal industries, mines, construction and textile industries).

At the end of the 1980s, family reunifications decreased and new motives of migration appeared: the last period is dominated by the breakup of the communism and the rise of asylum seekers. Especially in the years of the Yugoslavian civil war or the conflict between the Kurdish and Turkish population in Turkey, Germany received most of the refugees. Besides that, Germany allowed the immigration of Eastern Europeans who were of ethnic German origin.[11] As Germany didn't regard

[11]These immigrants do not count as immigrants in official German statistics. There is actually

itself as an immigration country, there was no guideline to reorganise immigration considering the needs of the German state and economy. With the immigration law of 1993, the number of asylum seekers decreased rapidly, because they could be sent back if they had immigrated from a safe third country, and the social benefits for immigrants were largely cut down. In 1999, the *Staatsbürgerschaftgesetz* removed an important obstacle for the integration of foreigners in Germany: it was possible to acquire the German nationality after 8 years of residence or as a child of immigrants with its 18th birthday. In 2001, the first immigration law was provided with directed search for migrants who might be needed in Germany.

2.3 Today's immigrant population in the USA and Germany

We will discuss the current economic status of the immigrant population within five categories: (un-)employment, labour force participation, self-employment, wages and education. In each section we show the stylised facts of the immigrant population in the US and compare it with the respective status in Germany.

(Un-)employment status of immigrants In general, immigrants (male or female) have higher unemployment rates compared to US natives. The unemployment rates are lower for the elder immigrants and unemployment rates are much higher among immigrant women relative to immigrant men. Obviously, the unemployment rate also depends on the educational attainment of immigrants. The immigrant groups are divided in one part with low unemployment rate and high

no official category as foreign-born in European statistics, which causes problems for the empirical evaluation for countries like France and the UK (naturalised immigrants) or Germany (cf. Zimmermann, 1995).

employment rates (Europeans, Canadians, Asians and Africans) and a second part with the opposite characteristics (Latin Americans, Caribbean and especially Mexicans). This bimodality holds for all following categories (cf. Chiswick and Sullivan, 2005)

Immigrants are more employed in the private sector as in government agencies. But the negative government agency bias disappears with the duration (raising naturalisations) and the higher English-proficiency. Again, Mexicans have the lowest rates of government employments and Asians the highest. The occupational distribution is nearly the same for native and immigrant men, but differs largely among immigrant and native women. The Western Europeans, Canadians and Asian are largely represented among managerial or professional occupations whereas the Latin Americans and Mexicans are mainly occupied in operative and laborer jobs. The often cited claim that immigrants take jobs which natives did not want to do, cannot be documented in general (cf. Chiswick and Sullivan, 2005).

In the 1960s, the unemployment rate of immigrants was still lower in Germany but this changed with the starting recession in the beginning 70s. The German government introduced the law of the priority of natives for receiving a job (*Inländerprimat*). Today, the overall unemployment rate of immigrants is higher than the respective unemployment rate of natives: 19.1 per cent as unemployment rate of foreigners and 10.8 per cent for natives in 2002 (cf. Bauer et al., 2005). Interestingly, we can not find the bimodality of unemployment experiences as in the US. In Germany, all groups except the Spanish immigrants have higher unemployment rates with the Turkish community experiencing the highest unemployment rate

(23.6 per cent). The employment structure is in general the same as in the US. Most of the immigrants – especially the guest workers and the ethnic Germans – work either in operative and laborer jobs while natives work more in managerial positions. Immigrants are employed mostly in the construction, mining and service sector. The decline of these sectors may be one reason of their higher unemployment rates.

Labour Force Participation The labour force participation rate of US immigrant men is slightly higher (89 per cent) than the labour force participation rate of native men (87 per cent). But the difference in the labour force participation between immigrant and native women is in favour of the native women (70 per cent vs. 63 per cent).[12] Next to gender, the duration of residence also matters for the labour force participation. Immigrants have higher participation rates with higher duration, because elder immigrants have invested more into US-specific skills through, e.g., language or on-the-job-training. In fact, after five years of residence most of the immigrants have adjusted their labour force participation.

The labour force participation rates in Germany are comparable to these of the United States. The rate of native men and women is about 82 per cent and 70 per cent, respectively. The overall rate of immigrant men is about the same as for native men but the rate for immigrant women is much lower than for native women (cf. Velling, 1995). The larger gap in the participation rate of women can be explained by the high labour force participation rate of women from East Germany who already had high participation rates relative to West Germany.

[12]The differences in the gender labour force participation rates maybe explained by e.g., the marital status, schooling or children (cf. Chiswick and Sullivan, 2005).

Self-employment In the past, the self-employment rates for US immigrants (16 per cent) were higher than for natives (10 per cent). That has changed to nearly the same self-employment rates (cf. Chiswick and Sullivan, 2005). Borjas (1986) explained the differences in self-employment probabilities between immigrants and natives with the concentration of immigrant groups in certain geographical areas. This enclave effect, as Borjas calls it, is due to the better understanding of tastes and language by self-employed immigrants compared to natives. Natives have therefore a natural disadvantage in certain self-employment industries.[13] This difference is especially obvious for the self-employers in the food and service sector. In an extension of the model of Borjas (1986), Borjas and Bronars (1989) show that minorities (instead of immigrant groups) should have overall lower self-employment rates, their self-selection in self-employment is negative and their income from self-employment is lower than for respective natives. They explain these patterns by consumer discrimination and the enclave effect mentioned above. Interestingly, the groups of the Black and Mexican minorities follow their predictions, but the Asian minority follows more the characteristics of the white native reference group.

In Germany, the general tendency (for natives and immigrants) to be self-employed is lower than in the US. Natives have a self-employment rate of about 12 per cent and immigrants only have a self-employment rate of nearly 7 per cent. These figures are even more surprising when we take into account that self-employed immigrants earn a lot more than comparable salaried immigrant workers in Germany.[14] A further difference to the US is that the shapes of the age-earnings

[13] The enclave effect is supported by Lofstrom (2002) whereas Yuengert (1995) finds no such effect.

[14] As in the US, the respective immigrant groups partly differ in their attitudes concerning self-employment, e.g., the Turkish community are twice likely to be self-employed compared to

profiles are similar for immigrants and German natives. The reasons to become self-employed as, e.g., the avoidance of unemployment, are the same in both countries (cf. Constant and Zimmermann, 2004, 2006).

Wages The characteristics of the wage earnings development in the US are described by the seminal paper of Chiswick (1978). Usually the age-earnings profiles of immigrants are steeper than for natives: immigrants have lower wages in the beginning, catch-up over a period of 10 to 15 years and often end up with even higher wage earnings than comparable natives. This development is explained by higher incentives to invest in country-specific human capital and positive self-selection of immigrants. Nevertheless, the development of immigrant earnings is rather controversial: the pattern of catch-up by Chiswick was first-time questioned by Borjas (1985, 1995a). Borjas uses a within-cohort analysis and finds a relative decline of wages of subsequent immigrant cohorts and no complete convergence of wages between immigrants and natives. He attributes the decline of educational attainment of immigrants as reason for the decreasing assimilation of immigrant earnings. In contrast Chiswick (1986) and more recently Card (2005) disagreed on the often expected decline in immigration educational attainment and show that the catch–up of immigrants earnings is still present. Still, the divergence between different source country groups is rather high: Europeans, Canadians and Asians earn more than Mexicans or Latin Americans. And it will be the former groups who catch-up or even overtake the respective group of natives.

The literature on (the convergence of) wage earnings of immigrants in Germany

other immigrant groups (cf. Constant et al., 2006).

is extensively surveyed by Bauer et al. (2005). Apparently, immigrant earnings in Germany do not show the kind of convergence as in the US. Especially, guest workers show either none or only little wage adjustment over time. Dustmann (1993) explains this difference by the temporary character of migration due to the guest-worker system. Temporary immigrants will invest less in human capital and are often negatively selected. In comparison to the second large group of immigrants in Germany – the ethnic Germans – the differences are even more surprising: Bauer and Zimmermann (1997) and Schmidt (1997) report no significant initial earning gap between ethnic and native Germans and nearly the same age-earning profiles as native Germans. The reason for this fast assimilation is a higher investment in country-specific human capital.

Education In general, immigrants are characterised by lower educational attainment compared to natives. Within the group of immigrants, educational attainment of men is higher than that of women. The proportion of the highest educational attainment (more than 16 years of schooling) is the same among immigrants as among natives but the group with the lowest educational attainment is significantly larger among immigrants than natives. Interestingly, Chiswick and Sullivan (2005) find no large variation concerning the arrival date, but a strong dependence on the source country. The change in the source countries of the recent decades influences the overall education as well as the dispersion of education. Thus, the two main sources of immigration – Asia and Latin America (mainly Mexico) – lead to a bimodal distribution: very high and homogeneous educational attain-

ment among Asians and very low educational attainment of Mexicans.[15] Besides schooling, language is an important factor for the assimilation of immigrants as higher language proficiency leads to a better labour market outcome and better integration of immigrants. The bilingualism of immigrants (a second language is spoken at home) is again highest among Mexicans and Asians and less important among Europeans and Canadians. The latter communities report also the highest proportion of a very well English-fluency. Not surprisingly, the language-fluency increases with the duration in the US.[16] Germany's immigrants aren't characterised by a bimodal distribution of education: the overwhelming part of the guest worker (and also ethnic Germans but they show faster assimilation to the Germany-specific human capital) are low skilled, high skilled immigration is quite low. One explanation of the missing high skilled immigrants in Germany is the guest-worker system. It has attracted mostly temporary immigration which is low skilled and had no incentive to invest into human capital. Thus, the difference in human capital investments between different immigrant groups may be explained by the different return propensities (cf. Dustmann, 1999). The language proficiency of German immigrants exhibits the same characteristics as the US immigrants (cf. Dustmann, 1994).

We have shown how the different immigration policies of both countries have shaped the composition of immigrant population. Furthermore we have seen the differences in the existing immigrant population. In the next section, we will review the theoretical explanations how immigration influences the labour market

[15] See Borjas (1994). The differences between the ethnic communities can be also shown by their school enrollment rates (cf. Hirschman, 2001).

[16] See Rivera-Batiz (1990) and Chiswick and Miller (1995, 1999) on studies for the US, Berman et al. (2003) on evidence for Israel and Dustmann and Fabbri (2003) on evidence for the UK.

outcome of natives – considering different labour market institutions.

3 The theoretical impact of immigration on labour markets

In this section, we provide a general analytical framework to discuss several theoretical results concerning the impact of immigration on labour markets in the host country. Basically, we distinguish two kind of models, namely models with competitive labour markets and models with rigid wages. We start with the presentation of a competitive economy where the number of goods and factors are the same and analyse as a special case the well-known Heckscher-Ohlin-model (later on: HO-model). We continue with the uneven cases of either less goods than factors where we analyse the Berry-Soligo-model (one good and two factors), and the Ricardo-Viner-model (two goods and three factors) or less factors than goods where we look at the special case of a continuum of goods. Furthermore we show the Ricardian framework as well as increasing returns. After providing an analysis of competitive economies, we introduce rigid wages and reconsider the impact of immigration.

3.1 Competitive factor markets

3.1.1 General framework

We will give a general theoretical framework in which we discuss different theoretical models of the impact of immigration on native wages and employment.[17] Our starting point will be the so called *integrated world equilibrium* where factors are fully mobile across countries and product and factor markets are fully competitive. We consider an economy with N goods and M factors and identical technologies across countries. Assume that production of these goods can be described by a concave and linear homogeneous production function $y_i = f_i(v_i), \quad i = 1, ..., N$ where $v_i = (v_{i1}, ..., v_{iM}), \quad i = 1, ..., N$ is the vector of factor inputs. The vector of factor prices is $w = (w_1, ..., w_M)$. The corresponding unit-cost function can be written as:

$$c_i(w) \equiv \min_{v_i \geq 0} \{wv_i \mid f_i(v_i) \geq 1\}.$$

$c_i(w)$ describes the minimum cost to produce one unit of output. After applying Shepard's Lemma, we get the factor intensities or the optimal factor demand for each factor: $\partial c_i / \partial w_j = a_{ij}(w)$.

Under perfect competition on goods markets, firms generate zero profits which results in the following zero-profit conditions:

$$p_i = c_i(w), \quad i = 1, ..., N. \tag{1}$$

Combining the zero-profit condition with the full employment conditions by and

[17] Most of the following exposition is based on Trefler (1997) or Feenstra (2004).

inserting $\partial c_i/\partial w = a_i(w)$ in $v_i = y_i a_i(w)$, we get the factor market equilibrium condition:

$$\sum_{i=1}^{N} a_{ij}(w) y_i = V_j, \quad j = 1, ..., M, \tag{2}$$

with V_j as the endowment of factor j. Finally, consumer preferences are homothetic and identical across countries and we get the goods market equilibrium condition:

$$y_i^W = D_i^W(p_i), \quad i = 1, ..., N, \tag{3}$$

where the world demand D_i^W for good i must equal the world production of this good. The three equilibrium conditions, (1), (2) and (3), can be solved by the following triple: $w = w^*$, $p = p^*$and $y = y^*$.[18]

Suppose we analyse the case of the same number of goods and factors. The most common type of the models with the identical number of goods and factors is the 2×2 Heckscher-Ohlin (HO) model, with $M = N = 2$. In this setting and if factors are free to move between sectors, factor prices are equalised and thus only depend on world endowments of factors.

These factor world endowments are shown in figure 1 on the vertical and horizontal axis for two factors (labour and capital) and two countries (home and foreign). Including the total factors used in production of good i, we get $A_i = a_{ij} D_i^W$. Summing these up gives the factors used in world production. We can show that in the parallelogram $0^H A_1 0^F A_2$ in figure 1, both countries produce both goods (the cone of diversification for both countries) and factor price equalisation occurs

[18]See Dixit and Norman (1980) and Woodland (1982) as classical references.

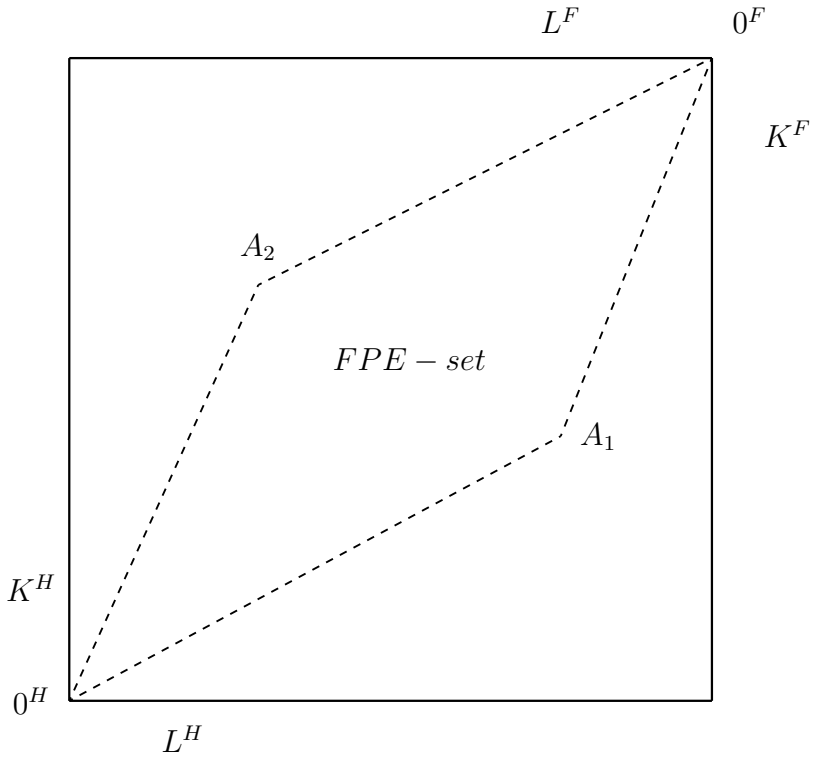

Figure 1: The factor price equalisation set.

even without any factor mobility:

$$V_j = \{v \mid v_i \leq a_{ij}(w^*)y_i, \quad 0 \leq y_i \leq y_i^*\},$$

which is the set of possible distributions of v over countries that is compatible with (w_i^*, y_i^*) although factors are not mobile internationally. That is the important result that trade in goods can substitute for trade in factors which is due to the export of e.g., the labour-intensive good by the labour-abundant country.[19]

Now, we analyse how the factor price equalisation set changes if we have either

[19]We are not considering here the debate in international trade theory if trade liberalisation leads to less factor mobility. See Venables (1999) for an survey on this topic.

more or less goods than factors. We start with the case of more factors than goods ($M > N$). The most common models are the Berry-Soligo-model (2×1) and the specific-factors-model (3×2). In general, we can conclude that factor price equalisation is unlikely to occur in these kind of models. Usually, a change in the factor endowments leads to a change in factor prices so that the input coefficients a_{ij} will change.

In the case of less factors than goods ($M < N$), V_j has a positive measure. Suppose we have the situation of an economy with three goods and two factors ($M = 2 < N = 3$). We have then three first-order conditions and two unknowns which give us no explicit solution. According to different price vectors which allow for zero profits, there are either multiple solutions for the outputs of the three sectors or specialisation in two of three sectors. Under the assumption of an integrated world equilibrium and market clearing for the goods and factor markets, we get a factor-price equalisation space where the national outputs are undetermined. Beyond the factor-price-equalisation space, specialisation in the goods production leads to a determined production structure if factor prices differ between countries. This solution can be reached if we concentrate on endowment differences of the countries: the capital-rich country has to specialise in the production of the capital-intensive goods.[20] In the following section, we will analyse the welfare and distributional effects of immigration under factor price equalisation or without factor price equalisation.

[20]See Dornbusch et al. (1980) for a model with two factors and a continuum of goods.

3.1.2 Migration within the factor price equalisation set

Under factor price equalisation, there are the same wages in all countries and thus there are no incentives to migrate at all. The resulting immigration surplus is zero and there are no distributional effects of immigration. If we would abandon the assumption of an integrated world equilibrium, we may consider e.g., a small, open and fully diversified economy. In this case, an inflow of immigrants will lead to an increase in the output of the sector which uses this input intensively and decreases the output of the other sector. This result is summarised by the Rybczynski-Theorem. Thus, immigration wouldn't lead to any wage or aggregate employment changes of native workers.

Trefler (1997) shows that these results are robust against technology or input quality differences between countries. He shows, that under the assumption of a constant returns to scale productivity measure, factor price equalisation holds for productivity adjusted wages. In the case of costly factor and good movements in the same type of model, Venables (1999) can explain that trade liberalisation may reduce the immigration flows through a reduction of the factor-price differential.

3.1.3 Migration without factor price equalisation

First, we analyse the case of less goods than factors ($M > N$). We are especially concentrating on the aforementioned models: the Berry-Soligo-model which has one sector and two factors and the Ricardo-Viner- (or specific-factors) model with two goods and three factors.

One-sector model

In the theoretical literature based on labour economic approaches, one sector models are often used which generate different results to the multisector models.[21] We present an open economy but you get the same results if you would consider a closed economy or a large country as e.g., the US (see Borjas (1995b, 1999)). Introducing $M = 2$ factors (suppose e.g. one factor L as labour und one factor capital K) and one sector $N = 1$, Borjas (1995b, 1999) shows that the benefits of natives from immigration depend on whether natives are capital owners and whether immigrants have complementary capital endowments as natives. First we consider the case where immigrants do not take any capital with them. The total income of the host country excluding immigrants is given by $Q = rK + wL$. The price of output will be the numeraire meaning that factor prices are measured in output prices. With perfect competition on factor and goods markets, marginal products equal marginal costs: $w = f_L(L, K)$ and $r = f_K(L, K)$. With an additional inflow of immigrants M, the aggregate labour supply will be increased by $\Delta L = M$ which leads to a wage reduction from w to w'.

In figure 2, the $f_L(L, K)$- curve denotes labour demand and the vertical line which originates in N depicts labour supply before immigration. The equilibrium wage before immigration is then given by w. With the inflow of $\Delta L = M$ immigrants, labour supply shifts outwards. The respective equilibrium wage is therefore reduced from w to w'. Native wage income will fall from wN to $w'L$ but the differ-

[21] Most of the following analysis is based in the seminal paper of Berry and Soligo (1969). They show that the first immigrant who arrives in the host country receives her marginal product and has no impact on native welfare. But the following immigrants still receive their marginal product but lower the wage for each intramarginal immigrants. Generalisations of the model of Berry and Soligo are Wong (1986) and Quibria (1988). The first result of the impact of an marginal immigrant was introduced by Grubel and Scott (1966).

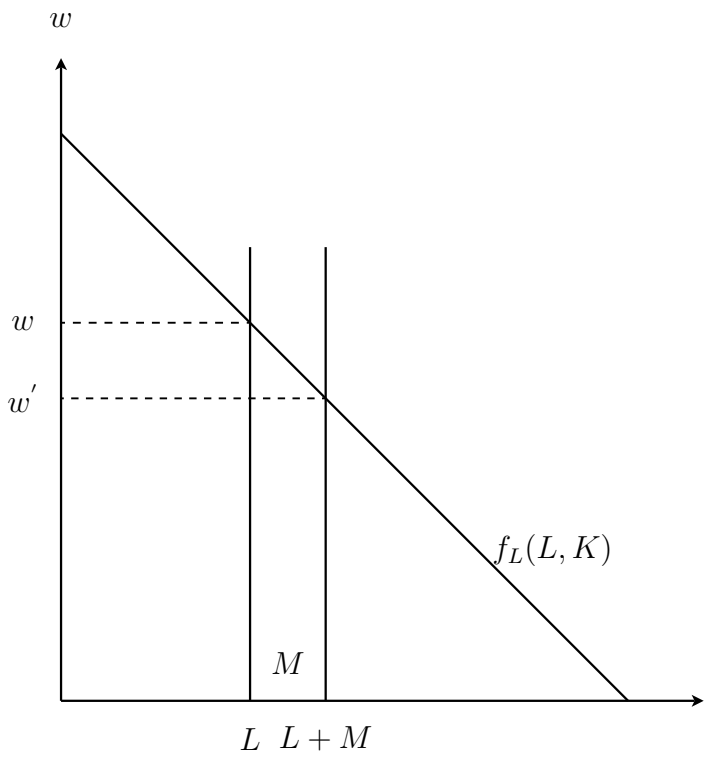

Figure 2: The immigration surplus of a one -sector economy.

ence of $(w-w^{'})L$ will be distributed to native capital owners. The depicted triangle in figure 2 shows the resulting immigration surplus of the native population.

The major difference to the two sector model is that now factor prices depend on factor endowments: the wage falls with an increasing number of immigrants in the host country. The influence of immigration is a redistributive effect: the aggregate welfare of the native population will rise but the gains accrue only to native capital owners while native workers experience a reduction in wages. The result changes if we consider that immigrants take capital with them to the host country. E.g. immigrants, who enter the host country with as much capital as natives own, will replicate the existing economy. Thus, the resulting immigration surplus would be

zero.

Furthermore the immigration surplus depends on the elasticity of the labour demand curve. What happens to the immigration surplus if we weaken either the assumption on the elasticity of the labour demand curve? If the labour demand curve would be perfectly elastic (which results from the diversified production structure), immigration have not had any influence on the native wage and immigrants would receive the resulting immigration surplus. [22]

Now, we consider the case of three factors $M = 3$ one sector $N = 1$: high skilled labour L_H, low skilled labour L_U and capital K which is mobile across countries. Both immigration surpluses (either for the case of purely high skilled immigration or purely low skilled immigration) are positive so that it is not clear if a country should admit high or low skilled immigrants. Borjas (1995b) argues that the immigration surplus of immigration of high skilled workers should be higher because the elasticity of the factor price for high skilled labour is larger for high skilled worker than for low skilled worker. An economic explanation for this higher elasticity is that high skilled labour should be complementary to the factor capital. Typically, there should be also an opposite effect: if the native population is mainly high skilled, the substitubility of high skilled immigrants may compensate the positive immigration surplus from the complementarity of production of high skilled labour and capital. For countries like the US and the UK, which are characterised by competitive labour markets and mostly low skilled immigration, immigration is positive for the overall native population, but capital owners and high skilled natives gain while low skilled natives lose.[23] As in Berry and Soligo

[22] See Borjas (1999) for a detailed derivation of this result.

[23] The picture of the benefits of immigration may be different if the immigration surplus would

(1969), the theoretical welfare analysis of Borjas would imply a laissez-faire immigration policy. The model of Borjas shows clearly the distributional consequences and the possible welfare gains of immigration for a native labour market. But in an economy with endogenous labour supply in which immigration will affect the educational decisions of natives, the distributional consequences depend on the host country's level of education and the educational endowment of immigrants (cf. Lumpe and Weigert, 2004). Focusing on skill premia, immigration may influence the educational decision that the resulting skill premia would be compensated and therefore leading to lower wage inequality.

Specific-factors model

In the specific-factors model, we change the assumption of factor mobility between sectors: one factor will be now sector-specific. Assuming $\bar{K}_i$ as a sector-specific input, L will still be mobile across sectors. We get a different equilibrium condition from the general framework:

$$p_i = c_i(w, r_i), \quad i = 1, 2,$$

where factor prices for the factor K will not be the same across sectors.[24] In this case, and considering the same good price as well as technologies for both countries, factor-price equalisation will be quite unlikely. In the short run, the factor prices for capital between both sectors – r_1 and r_2 – are different due to the sector specifity of the factor capital. Furthermore, for an increase in the endowment of the mobile

include any transfers as, e.g., social service payments. The gains or loses from the use of transfer payments are also debated in the literature (see Borjas (1994) for an overview on the literature and Lofstrom and Bean (2002) on the recent development).

[24] We could also say that capital supply is totally unelastic.

input (e.g. immigration), the Rybczynski-Theorem does not hold. Specifically, sectors do not expand asymmetrically but both expand.

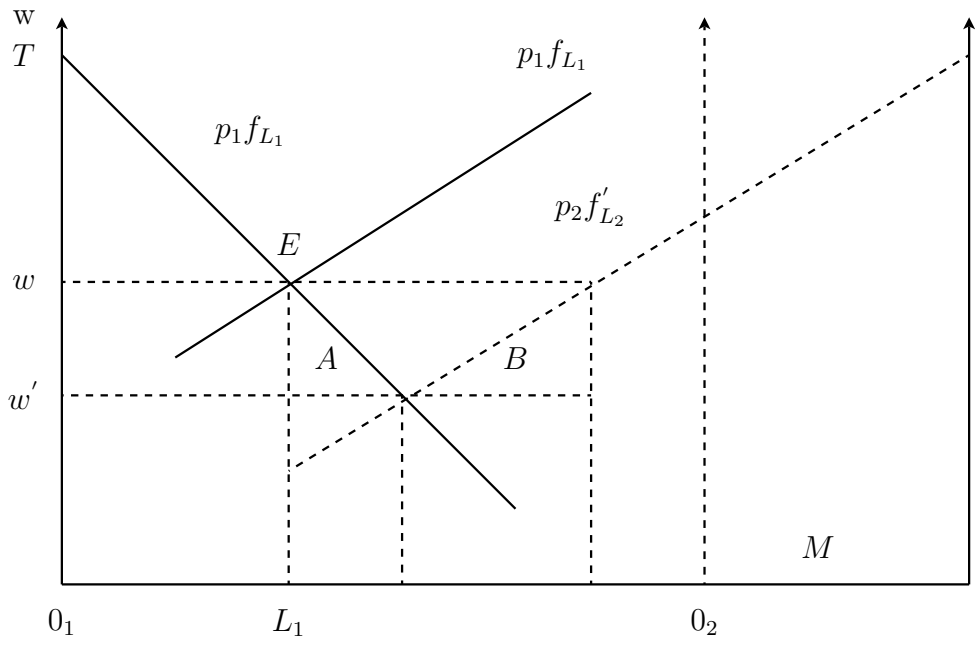

Figure 3: The immigration surplus in a specific-factor model.

In figure 3, the revenue belonging to sector 1 is then the area O_1TEL_1 and the income generated by labour is O_1wEL_1. Obviously, the same holds for sector 2. If $\Delta L = M$ immigrants arrive, the wage decreases to $w^{'}$ to accommodate the increased labour supply but the interest rates and the output for both sectors increase. The areas A and B in figure 3 are the immigration surplus which shows the shift of income from labour owners to the owners of the sector-specific input. Immigration will be beneficial for the host country as in the case of the one-sector model. We get the same effect as in the one-sector model: a host country's welfare rises by the immigration surplus. Obviously, the home country also gains from

immigration.

In the case of more goods than factors, the production structure is determined through specialisation in a range of goods by each country (cf. Dornbusch et al. (1980)). In this model, we can not exactly say which kind of influence immigration has on native welfare.

3.1.4 Ricardian model

Trefler, 1997 analyse the effects of immigration in a Ricardian model of the Dornbusch-Fischer-Samuelson type (c.f. Dornbusch et al., 1977).[25] For the ease of exposition, we limit the analysis to $N = 3$ sectors. The only input is now labour and we assume that the host country only produces good 1 while the origin country produces the other two goods. To produce one unit of output, we need $a_i, \quad (i = 1, 2, 3)$ units of labour. We get long run zero profits by equalising the price of the good p_i to the cost of producing one unit of the good: $w/p_i = 1/a_i$. The goods are ranked according to the following index (asterisks denote the foreign country):

$$a_1/a_1^* < a_2/a_2^* < a_3/a_3^*.$$

Suppose that the host country produces only the first good. If immigration takes place, all immigrants will be employed to produce good one which leads to an excess supply of the first good. The home trade deficit drives down home wages until $w/p_2 = 1/a_2$. Thus, the wage in the host country is driven down until it can also produce the second good. In contrast to the foreign country where

[25] Findlay (1982) analysed first the impact of immigration in a Ricardian model.

the production of the second good will shut down because of rising wages. The resulting immigration surplus is negative as the wage for producing the second and third good have fallen and the wage for producing the first good will be constant. As example could serve industries which only survive because of the existence of immigrants, e.g., agriculture.

Davis and Weinstein (2002) introduce a Ricardian model in which labour of the home and the foreign country are not identical. Both type of labour are divided by a productivity measure. The productivity of labour in the home country is higher than in the foreign country. Immigration takes place if the host country has a technological superiority in all of the respective factors (e.g., the US). They argue that this kind of immigration leads to high income losses of natives and the source countries will receive all gains from immigration. Felbermayr and Kohler (2007) combine the wage effect of Borjas (1995b), the terms-of-trade effect of Davis and Weinstein (2002) and endogenous goods prices into a general framework. They can show that the terms-of-trade effect dominates the other effects if immigration inflows are small. Furthermore they demonstrate that repatriation of immigrant income in combination with a non-tradable goods sector may have an important influence on native welfare.

3.1.5 Increasing returns to scale

Introducing increasing returns to scale which are external to the firms to preserve a competitive economy, taking labour as the only input and staying in a world with two countries and two goods, the first result is that immigration increases native productivity. The increasing labour force in the host country increases the

productivity and welfare of natives. A second effect is the expansion of the output which leads to lower prices which shifts the terms of trade negatively and reduces natives welfare. The trade off between both effects generates an optimal immigration level. Immigration is welfare-enhancing if immigration is small compared to the native population. But for large native workforces or large immigration flows, the effect of immigration is negative.

3.2 Introduction of rigid wages

The analysis in the previous section has focused on competitive labour markets where wages are flexible. There is considerable consensus among labour theorists that these conditions plausibly match with the Anglo-Saxon labour markets. Continental labour markets, however, are often characterised by rigid wages and resulting unemployment. Wage rigidity may be caused by minimum wage legislation, union wage setting, search frictions or efficiency wages. With the analysis of rigid labour markets we may also discuss the effects of immigration on unemployment, that are emphasised in public debates.

We start with the analysis of Davis (1998) who introduces immigration and rigid wages in our general framework from the former section: the integrated word equilibrium. With the introduction of a minimum wage and thus unemployment in Europe, he analyses the impact of immigration on US welfare. He shows that the effects of immigration may not take place in the host country (in his case the US) but in the other part in the world (Europe): Davis' insulation hypothesis. In his model, an exogenously given rigid wage in Europe determines all factor and good

prices in both parts of the world rsulting from the under the assumption of a full diversified production structure.[26] This result stems from the zero-profit conditions (cf. (1)) in which the minimum wage $\bar{w}$ must be supported by an appropriate goods price $\bar{p}$. The only possible way of adjustment to immigration into the US from a third country (e.g., Mexico) is therefore a compensation through the European and US production structure: hence through the European unemployment rate and exactly offsetting Rybczynski-effects. Hence, figure 4 shows the factor price equalisation set where the level of European unemployment is depicted by the line $0^{EU}U$.

Therefore the impact of low skilled immigration into the US would be seen in a rise in the European unemployment rate instead of a US wage reduction. Put it differently, under constant goods prices, immigration into the US results in excess supply of goods and rising unemployment in Europe without any immigration to Europe.[27] There are two problems of this model: the assumption of a fully

[26] There are other models which exhibit an exogenous minimum wage. Brecher and Choudhri (1987), for example, extend the Berry-Soligo-framework by including international trade in goods. Furthermore they introduce a minimum wage by a unemployment insurance financed by a lump-sum tax system. In this case, the high wage (capital abundant) country will follow a no immigration policy as optimal immigration policy.

Another possibility to analyse unemployment resulting from an institutionally set minimum wage is the well known Harris-Todaro model (cf. Harris and Todaro (1970) and Ghatak et al. (1996) for a survey on this literature) which considers rural-urban migration. In this model, an expected higher wage in the urban sector will lead to immigration from the rural sector. Immigration and unemployment will coexist as long as the expected urban wage is higher than the rural wage. To reduce unemployment, the government has either to pay wage subsidies or introduce migration barriers. Therefore several authors have focused on the effects of immigration on labour markets where unions dominate the wage-setting behaviour. In the context of the Harris-Todaro model, Calvo (1978) extends this framework by allowing unions to negotiate wages with firms. But he still needs the migration barrier to increase native welfare. Bhagwati and Srinivasan (1974) and Corden and Findlay (1975) show policy measures which allow for free migration in this type of model.

[27] Meckl (2006) shows that the results of Davis (1998) change with the introduction of native educational decisions and labour heterogeneity, which results in a different minimum wage policy.

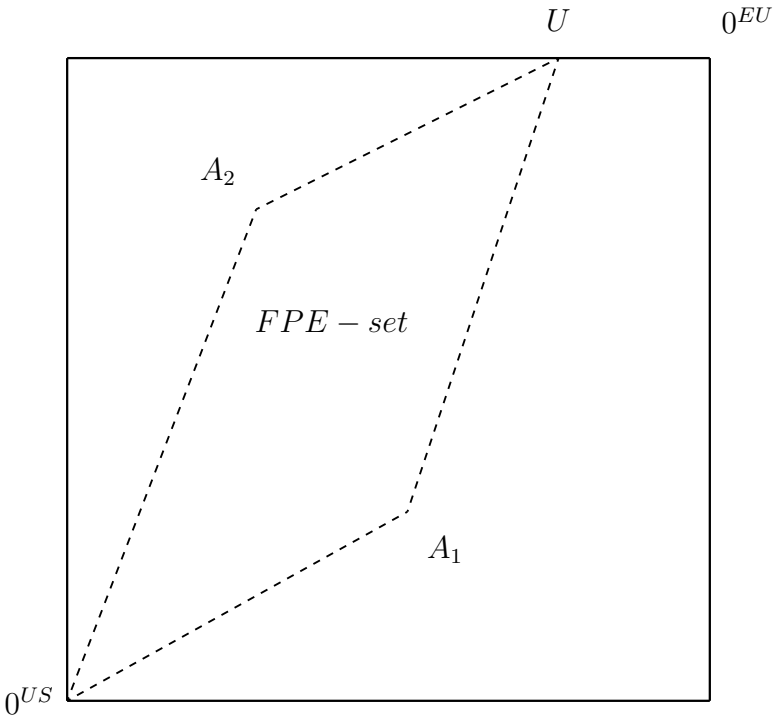

Figure 4: The factor price equalisation and unemployment.

diversified economy as well as the exogenous minimum wage.

Therefore we show now two type of models where the minimum wage is endogenous. In order to incorporate institutional features characterising German labour markets, Schmidt et al. (1994) and Fuest and Thum (2000) endogenise the wage by introducing minimum wage setting by a monopoly union or efficient bargaining. Schmidt et al. (1994) examine the impact of low skilled mass migration on natives (high and low skilled) who are organised by a monopoly union. As in Borjas, the technology is a constant returns to scale production with three inputs: capital, low and high skilled labour. The assumption is that immigrants are substitutes in production to low skilled natives, but complements to high skilled natives. Immi-

grants do not take any capital with them and they are not included in the union's objective function. The monopoly union sets the wages of low skilled workers while employment is determined by firms. Both groups receive unemployment benefits which are financed by income and capital taxes. The union maximises the wage earnings of natives including unemployment benefits and negotiated wages. The objective function of the union is the sum of the wage bill of skilled and low skilled workers and unemployment benefits. The effects of immigration in the case of a monopoly union are unclear: low skilled immigration leads to replacement of low skilled natives and to higher unemployment benefit payments by the government. But unions may negotiate lower wages to offset the replacement effect, leading to higher low skilled native employment and higher wages of high skilled natives. Still, the result depends largely on the substitubility/complementarity relation between the three inputs, the employment fraction held by natives or the consideration of immigrants in the union's objective function.

Fuest and Thum (2000) consider an efficient-bargaining model concentrating on firm wide wage negotations.[28] The small open economy in their model has two sectors: a unionised and a competitive sector, where the technologies with two inputs – capital and labour – exhibit decreasing returns to scale. Immigrants work with a certain probability in the unionised sector and they take no capital with them. Instead, all firms are owned by natives. The general effect of immigration is that it raises employment in the unionised sector because the reservation wage in the competitive sector declines. A declining reservation wage leads to a weaker

[28] This type of union behaviour is mostly known from Scandinavian countries and contrasts with more or less existing nation wide unions in countries like France or Germany. Especially, the full employment result does not match very well with German labour market properties.

position of unions in the wage bargaining process and therefore lowers wages in the unionised sector resulting in higher employment in the unionised sector. Unionisation and immigration then have two opposite effects on natives' welfare. The positive effect is the employment effect shown above, the negative effect is that immigrants are paid above their marginal product if they work in the unionised sector. The welfare effect of immigration largely depends on the wage elasticities of labour demand in the two sectors. If these elasticities are identical, both effects cancel out and we get the same result as for competitive labour markets. If the elasticity of labour demand is higher in the unionised sector then the overall welfare effect is positive. The employment effect in the unionised sector overcompensates the negative effect. If the elasticity of labour demand is higher in the competitive sector, only large and sustained immigration flows are beneficial. Immigrants are driving down wages, but natives overcompensate the wage losses by capital-earning gains.

As in the models for a competitive economy, the introduction of an endogenous labour supply through an educational decision of the native individual will change the exisiting results. Razin and Sadka (1995) present a model of endogenous human capital formation where immigration has a negative effect on native welfare. Fuest and Thum (2001) extend their previous model to discuss the effects of immigration on educational decisions and the respective labour market outcomes of natives. In their model, natives welfare increases with a certain amount of immigration. Mass migration has positive effects on the welfare of natives as it increases the number of skilled natives but a restrictive immigration policy (a low number of immigrants) will have a decreasing effect on natives welfare. Furthermore, Lumpe and Weigert

(2004) show that immigration may have an increasing effect on wage inequality if we consider labour market rigidities in combination with an endogenous labour supply.

Besides minimum wage legislation or union wage setting, there have been other labour market institutions applied to the analysis of immigration as, e.g., labour contracts, efficiency wages, and search frictions. Labour contracts have been introduced by Ethier (1985) to model temporary migration in an international trade model. Müller (2003) establishes a dynamic efficiency wage model with a dual labour market in a specific-factors mode. While immigrants differ only in their positive probability with respect to returning to their home country from natives, he can show that immigrants are discriminated by not receiving the good jobs. The segmentation of the labour market as well as the wage rigidity due the efficiency wages leads to a none-existing effect of immigration on native labour markets. The same way of modeling the differences between immigrants and natives has been used in a search-theoretic model by Lumpe and Weigert (2007). They demonstrate that underinvestment in human capital by natives (resulting from the hold-up problem) can be solved by a skill selective immigration policy and thus is Pareto-improving. In combination with education subsidies there the Pareto-optimal welfare level becomes attainable. However, Ortega (2000) was the first who introduced immigration in a search-theoretic model with two countries. In this setting, immigrants, natives and firms gain from migration.

Summarising the theoretical effects of immigration on labour markets and native welfare, we can conclude that there is no clear-cut effect. The models of competitive labour markets emphasise a positive welfare effect of immigration as well as a

part of the literature which concentrates on union-wage setting. Furthermore some studies suggest that immigration might increase native human capital investments. In contrast to these positive theoretical effects, trade theorists see either none effect or negative effects of immigation on native welfare. However, the distributional effects of immigration are clear-cut. Obviously, the US and Germany do not only differ in their labour markets but also, e.g., in their social welfare systems. The large social welfare systems in Continental European countries might be another source of positive or negative effects of immigration on social welfare.[29] Therefore the literature cited in this survey only tells a part of the story.

4 Empirical evidence

In contrast to the theoretical literature, the empirical studies focus on the distributional aspects of immigration, e.g., the impact of immigration on wages or employment of natives and do not concentrate on a welfare analysis of immigration. Interestingly, while the theoretical literature can predict clear-cut results on the distributional impact of immigration but can not predict these clear results for the impact on native welfare, the empirical studies argue on the distributional impact, e.g., the impact of immigration on native wages and employment. There are three major results for the impact of immigration on native wages and employment. First, the studies of Card (2005) and adherents find only a modest negative impact of immigration on natives wages and employment which can be neglected. Second, Borjas (2003) and adherents find a significant negative impact and third,

[29] See Razin and Sadka (1995) and Wellisch and Walz (1998) among others.

Ottaviano and Peri (2005) and Peri (2007) find a positive impact: so, everything is possible. In the following, we will discuss the different methods used and show their (dis-)advantages.

4.1 Local labour market approaches

We start with the local labour market approaches as they were the first empirical studies which were conducted on the effects of immigration on native wages and employment. These studies measure the impact of immigration on wages and employment by utilising cross-sectional data of cities or counties (e.g., the SMSA in the US). They use labour markets with less or none immigration (as an extreme case) as counterfactual to the labour markets with high immigration rates. Thus, they regress wages or employment measures of natives on the immigrant densities in these labour markets. Their results show a more or less negligible impact of immigration but the evaluation of local labour markets has been criticised on three different reasons:

- The location choice of immigrants is endogenous. The choice of immigrants maybe influenced by permanent region-specific effects as, e.g., the historic settlement pattern induces chain migration of following immigrant cohorts. Therefore immigration density and economic outcomes are correlated. A second reason for an endogenous locational choice of immigrants is that immigrants are attracted by local labour markets with higher wages caused by local demand shocks. This would lead to a downward biased estimate of the effects of immigration. The first problem of the permanent region-specific

effects can be solved by taking differences-in-differences and thereby removing the region-specific effect. Thus, the empirical studies will relate changes in immigrant densities to wages over two points in time. The second problem of local demand shocks is solved by using historical settlement patterns as instrument variable because pre-existing immigration pattern should be uncorrelated with recent local demand shocks. Instead of using historical settlement patterns, we could also concentrate on cases where the allocation is exogenous.

- Due to immigration, natives may tend to migrate out of local labour markets – leaving the relative labour supply constant. The empirical analysis can not identify the effect of immigration on wages which leads to an underestimation of the effect of immigration. The relevance of out-migration is not clear: Borjas (1999, 2003) regards it as serious problem while Card and DiNardo (2000) and Card (2001) find no out-migration. Possibilities to address these problems are either a two-stage estimation where in the first stage is shown that immigration does not lead to out-migration or including out-migration into the regression as omitted variable. These omitted variables have to be instrumented due to the correlation.

- Intercity trade and the induced Rybczynski or factor price equalisation leave no effect of immigration if it is measured over local labour markets. The local economies may adjust by their output mix instead by reducing employment and /or wages but the economy as a whole should have a downward sloping labour demand function.

The first study which used local labour market variations was Grossman (1982). She estimated a trans-log production function to derive elasticities of substitution between immigrants and natives. The measured impact of a 10 per cent increase in the number of immigrants would result in a 1 per cent decrease of native wages. However, natives are not separated by skills. Borjas (1987) extends the analysis of Grossman by introducing different native groups (Blacks, Hispanics, White, etc.). Furthermore he uses a Generalized Leontief production function and a different data set. He obtains the same result as Grossman for native earnings. Altonji and Card (1991) include instrument variables (the stock of immigrants) in their cross-section regression to control for an endogenous location choice of immigrants and estimate the effects of immigration on earnings and employment of minority groups and low skilled natives. They find that a 1 per cent increase in the fraction of immigrants reduces employment opportunities of the respective groups by 0.25 per cent. Wages are reduced by this increase in immigration by 1.2 per cent. To get an upper bound of the impact on earnings, LaLonde and Topel (1991) estimate the effect of newly arriving immigration on older immigrants. They use the different cohorts of immigrants as different inputs and conclude that the impact on native wages is unimportant but newly arriving immigrants reduce wages of older immigrants. Taking into account the different labour market institutions, we would expect that the results may differ for the German labour market. Pischke and Velling (1997) apply the framework of Altonji and Card to West Germany. They confirm the same effects on native employment and wages as the US studies and a previous study of Velling (1995) for Germany. In contrast to these two studies are the results from DeNew and Zimmermann (1994) which show a detrimental effect of immigration on wages and employment. Pischke and Velling attribute

these results of DeNew and Zimmermann to the different period examined. DeNew and Zimmermann used data from the 1970 to the beginning 1980s where a recession has taken place in Germany which has mostly hit the guest-workers concentrated industries.

Card (2001), again for the US, extends the existing models by including skill heterogeneity to measure the impact of the relative supplies of immigrants. He defines six occupational groups which are used as labour inputs in the underlying model. He corrects for local demand shocks by calculating the expected inflow rate of immigrants in the respective occupations on the basis of historical settlement patterns. Furthermore he controls for possible out-migration of natives due to immigration. Still, the results of the previous studies are proved robust. Employment and wages fall by about 1 per cent with an increase of 10 per cent in the population share of a respective occupational group, only in high immigration areas (like Los Angeles and Miami) the impact might reach up to 3 per cent.

Controlling for local demand shocks and region-specific effects can be done most effectively in natural experiment settings where the allocation of immigrants is exogenous. Card (1990) examines the impact of the Mariel boatlift immigration from Cuba to Miami in 1980 which led rose the labour force of Miami by 7 per cent. He compares the impact on wages and employment on different minority groups as well as native whites in Miami with five other cities in the US which are comparable to Miami concerning the industry structure. The resulting impact on wages and employment is negligible. Glitz (2006) uses the immigration of ethnic Germans into Germany in the late 1990s as quasi-experiments because these immigrants have been allocated exogenously over Germany by the government to guarantee an even

distribution. But, as Card (1990), he finds no negative impact of immigration the labour market prospects of natives.[30]

The local labour market analysis by Lewis (2003, 2004) tries to explain the none–existing effect on wages and employment by a change either in the industry structure of local labour markets or by within technological change of firms in these local labour markets. Relying on the theoretical frameworks of Acemoglu (1998) and Beaudry and Green (2003), increased supply of low skilled labour will lead to the adaptation of different technologies to meet the local skill mix. Therefore the technical change in areas with high low skilled immigration has slowed down. Furthermore he tests the Rybczynski-hypothesis (that the output of one sector but the factor prices stay constant) versus the aforementioned Acemoglu-hypothesis that production technologies adapts to the local factor mix.[31] He finds no effect of immigration on the industry structure or unemployment but a significant effect on the technology choice of firms. He concludes that the adaptation of firms to the existing input mix in local labour markets leads to a constant relative wage and employment.

All of the cross-sectional local labour market studies find a significant negative but only modest effect of immigration on wages and employment opportunities. Applying IV-methods generates stronger effects and differencing over occupational choice or skills leads – not a big surprise – to stronger effects among low skilled natives. However, labour market institutions do not seem to matter as the results

[30] Hunt (1992) uses the immigrant inflows of Algerian repatriates after the Algerian civil war as natural experiment while Friedberg (2001) concentrates on the Russian immigration towards Israel. Both studies analyse the impact of immigration inflows on national labour markets.

[31] See Hanson and Slaughter (2002) for an empirical study on the immigration induced Rybczynski-effect and factor price equalisation.

for Germany suggest.[32]

4.2 National labour market

4.2.1 Wage inequality

Still, other authors do not belief in the solutions done by the local labour markets approaches to meet the problems of this method. Instead, they argue that the empirical analysis should concentrate on national labour markets to avoid the problem of out-migration. A first strand of literature constructs the counterfactual by simulation of an economy without immigrants. These studies are mostly concerned with the impact of immigration and trade on wage inequality in the US. This simulation method is based on pre-estimated parameters as, e.g., the elasticity of substitution between high and low skilled labour. Therefore the underlying structural economic model (e.g., a CES-production function) may influence the resulting estimates: different elasticities of substitution drive the results on the impact of immigration on wages and employment. Further problems of this method might be the assumption of perfect substitubility of immigrants and natives within each skill group and the right allocation of immigrants to skill groups.[33]

Borjas et al. (1992) have introduced this method (they call it factor-proportion model) and find as result that immigration had not any negative impact on college/high school wage differentials but has harmed the high school dropout earn-

[32] In contrast, Angrist and Kugler (2003) find a negative effect of immigration in combination with less flexible labour market institutions.

[33] For example, high skilled immigrants might work in low skilled occupations in the first years after their arrival because of a lack of language proficiency.

ings. The induced changes from trade and immigration in the relative skill composition of the US explain about 40 per cent of the relative wage decline of high school dropouts where immigration is the main source of the wage decline. Borjas et al. (1996) compare the local labour market approach with their simulation methods. They find that out-migration and industry structure assimilation lead to the none–negative effects of the local labour market approach while their approach shows the detrimental effect of immigration and trade on low skilled natives. Borjas et al. (1997) analyse the impact of immigration in a simulation based model from 1960 – 1990. They show that a large displacement effect of natives exists due to immigration and get, concerning the impact on wages and employment, the same findings as in their analysis of 1996.

4.2.2 Skill-experience-cell approach

Borjas (2003) extends these models by including labour market experience differences between the respective immigrant groups because immigrants might not be perfect substitutes in the skill groups. Immigrants are then allocated among different skill-experience groups and within these groups, immigrants are perfect substitutes to natives. Thus, native cell specific wages or employment measures are regressed on the immigrant share in the respective cells.[34] Obviously, there arise problems if immigrants select into cells with better economic conditions. Another problem is the correct allocation of immigrants into the cells. Thereby, for an average native worker, immigration leads to a fall in wages of 3.2 per cent by an increase of 10 per cent in the immigrant share. The most detrimental effect has

[34]The method is comparable to the analysis used by Card (2001).

been on low skilled natives. The impact on high skilled wages, however, is only modest. Borjas (2005) implements a further critique – native out-migration – in a local labour model and compares it with the estimates of his national labour markets model. He claims that native out-migration explains 40 to 60 per cent of the existing wage impact differences concerning immigration which stands in contrast to the evidence found by e.g., Card (2001).

Relying on the framework of Borjas (2003), Ottaviano and Peri (2005) focus on the impact on the average native workers instead of only low skilled workers. They extend the model of Borjas (2003) in which they allow for imperfect substitubility of natives and immigrants within the skill-experience cells. Furthemore they allow for a certain degree of capital mobility while in the model of Borjas (2003), capital is always assumed to be perfectly immobile. They find immigration to be beneficial, because the average wage increased by 3 to 4 per cent for native workers due to immigration in the 1990s. Thereby, low skilled wages decreased by 1 per cent but high skilled wages increased by 4 per cent. Peri (2007) extends this framework by including native out-migration and still receives a possible impact of immigration. Orrenius and Zavodny (2006) combine the empirical strategies of Borjas (2003) and Card (2001) and use a new data set which allows a separation of new arriving immigrants from already assimilated immigrants. They generate results on occupational wages comparable to Peri (2007): the impact on the high and middle skilled occupational wages is positive while the impact on low skilled occupational wages is negative but small.

4.3 Summary

Card (2005) reviews the literature and critique on the local labour market approach and concludes that neither demand shocks, intercity trade nor out-migration of natives are responsible for the none existing impact of immigration in local labour markets. He even argues that even in the time series approaches of Borjas, the effect of immigration should be modest: *While the counterfactual is unknown, it is hard to argue that the aggregate time series evidence points to a negative impact of immigration unless one starts from that position apriori.* (Card (2005, p. 321)). This result is also confirmed by the new evidence of Lewis (2003) and Ottaviano and Peri (2005) who find no detrimental or even a positive effect on native wages and employment.

5 Conclusion

In this survey we have shown how the different immigration policies have shaped the different composition of the immigrant population in the US and in Germany. Both countries rather failed to implement a consistent immigration policy and most of the policies introduced had the adverse effect. Therefore the immigrant population is often characterised by higher unemployment rates and lower wages. The only large difference between both countries lies in the bimodality of skills among the immigrants of the US. Especially the Asian community supplies a large number of high skilled workers which is absent in Germany.

From a theoretical point of view, the impact of immigration generates robust

results concerning the distributional impact of immigration but is undecided on the welfare implications of immigration. In competitive labour markets, immigration is always beneficial if the economy is closed. For an open economy the results might reverse rather sharply. In rigid labour markets, the impact of immigration depends on the existing labour market institutions. An exogenous set minimum wage leads to a negative impact of immigration while unions may change their wage setting behaviour due to immigration and ask for lower wages. A further indirect but important impact of immigration might be on the educational attainment of natives.

The mixed results predicted by the theoretical literature carry over to the empirical studies. But in the empirical literature, the debate is on the distributional aspects of immigration and not on the welfare effects of immigration. Due to the different methods used, the impact of immigration on native wages and employment found by these studies differs largely. The impact on average wages is either small or positive up to 4 per cent but wages of native low skilled are decreased by either a modest 1 per cent or up to 8 per cent. Still, it is interesting that neither the different labour market institutions nor the different immigration concerning skills lead to different effects on native wages and employment for the US and Germany. We have not taken into account several other channels by which immigration may influence the welfare of natives. Apparently, the studies above include no illegal immigration which may enlarge a possible negative effect on low skilled wages and employment. We have not also considered any influence of immigration on the native welfare systems which may revise the results again.

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