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The Impact of the Bismarck's Social Legislation on German Emigration before World War I

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Abstract

The rapid decline of German emigration before World War I constitutes a puzzle that traditional explanations (decrease in the international wage gap, growing industrialization, fall in the fertility or international competition with other migrants) can only partly solve. It therefore seems necessary to go more deeply into the question, in particular by looking into the social legislation implemented by Bismarck during the 1880s. Actually, the German insurance system was one of the most developed in the pre-1914 world and it probably contributed to deterring labor outflows. The main explanation is that candidates for migration consider not only the gap between direct wages in sending and receiving countries, but also the differential in "indirect wages", that is, social benefits. As a matter of fact, the existence of such benefits constitutes a form of social remuneration that partly offsets low levels of wage rates in sending countries. In that perspective, the econometric tests run in the paper show that the increase in German indirect wages after 1885 was accompanied by a significant decrease in emigration rates.

JEL Classification: F22, H55, N30

Keywords: International Migration, Social Insurance, Germany

The Impact of the Bismarck's Social Legislation on German Emigration
before World War I

Oh say, why seek ye other lands?
The Neckar's vale hath wine and corn;
Full of dark firs the Schwarzwald stands;
In Spessart rings the Alp-herd's horn.

Ah, in strange forests you will yearn
For the green mountains of your home;
To Deutschland's yellow wheat-fields turn;
In spirit o'er her vine-hills roam.

Ferdinand Freiligrath (1832)

Introduction

The main difference between the pre-1914 globalization process and the present one probably lies on the scope of international labor mobility: while mass migration characterized the half-century that preceded World War I, our world is marked by the existence of restrictive migration policies over the whole planet. But border controls do not provide a sufficient explanation for the current low levels of labor flows. Thus, despite the free movement of persons inside the European Union, the number of European Union nationals who live in another member country is barely 5.5 million out of 370 million, that is, 1.5% of the European population (Veil, 1997). The increase in the standard of living in industrialized countries does not allow either to understand the phenomenon. Whereas the income per capita is higher in the United States than in European countries, labor mobility between American States is more important than in Europe. It is therefore necessary to look for an alternative explanation for the relative low levels of labor mobility prevailing today, in particular in Europe.

In this perspective, the question of the importance of State intervention in the social field has practically never been covered. Yet, it seems logical to think that there is a link between the implementation of social policies and the drop in the emigration. Indeed, it is likely that the existence of social insurance in the sending countries, in particular unemployment benefits, reduce the incentives to leave. Eventually, it can be argue that social benefits represent a form of indirect wages that candidates for migration value at the time of making their decision, in the same way that they value the wage gap between sending and

receiving countries, employment opportunities in both countries, or even transportation and settlement costs.

The implementation of the Bismarck's social legislation in Germany at the end of the nineteenth century is particularly interesting to illustrate the effects of the Welfare State on labor mobility. Actually, German social mechanisms aimed at supplying the vast majority of the economically active population with insurance against the main risks: sickness, industrial accidents, old age and invalidity. The coverage of German workers rapidly widened as well as the received benefits. But, at the same time that social benefits increased, the German emigration rate was going down, which constituted an exception in that era of mass migration. The question, then, is to know whether the 1880s social laws were responsible for the decline of German emigration before World War I.

In order to demonstrate the link between the development of social insurance and the drop in German emigration before 1914, the remainder of the paper is organized as follows. First, section I gives a brief description of the course of German emigration before WWI and shows that traditional explanations for the decrease in labor outflows are far from being satisfactory. Next, section II presents the advances of the social legislation implemented in Germany during the 1880s and 1890s. It provides, in particular, a dataset of social insurance that helps to understand the real impact of Bismarck's measures on German workers. Then, section III develops an analysis of the relationship between social policies and labor mobility. It notably shows, in a Todaro-type model, how the candidates for migration incorporate social benefits in their decision. Finally, section IV supplies econometric evidence of the repercussions of the Bismarck's social legislation on labor movements and tries to estimate what the German emigration rate would have been without such legislation.

I – The Rise and Fall of German Emigration before World War I

German emigration before World War I presented three main characteristics. First of all, the most important wave of departures occurred even before the worldwide mass migration phenomenon. Thus, with Ireland, which had to suffer the consequences of the famine, and Great Britain, that aimed to settle its colonies, Germany was one of the main labor exporters in Europe before 1860. Only between 1851 and 1860, more than one million Germans left their country. The second characteristic of German emigration is that Germany was the biggest provider of migrants in the United States before World War I. Between 1850

and 1914, 5 millions Germans crossed the Atlantic to work in the U.S., that is, more than Italians (4 millions), Austro-Hungarians (4 millions), Irishmen (3.5 millions), Britons (3.5 millions) or Russians (3.2 millions). The third characteristic lies on the fact that Germany was one of the few European countries that recorded structural drops in the emigration rate before World War I.

A brief history of pre-1914 German emigration

The transatlantic movement of migration from Germany to America officially began in 1683, when thirteen Mennonites families from Krefeld, who wished to escape religious intolerance, founded the city of Germantown, six miles northwest of Philadelphia. During the next decades, they were followed by hundreds of other German sectarians who found in Pennsylvania the freedom to exercise their religious practices. But, more than religion, it was the economic opportunities offered by the New World that generated an increase in German emigration during the eighteenth century. Most of the newcomers were independent farmers who settled from Pennsylvania to the Cumberland Gap in extreme southwest Virginia. As a consequence, over two hundred thousand German-speakers were established in the American colonies before the Declaration of Independence in 1776 (Nugent, 1995). But, from then, the flow of migrants dramatically slowed down, and it was only after 1815, when the end of Napoleonic Wars allowed Europeans to resume the emigration process, that Germans began to move massively to the United States.

Figure 1 shows the evolution of the German emigration rate during the century that precedes World War I (1820-1914), and the most important events that characterized the period. It is possible to distinguish three phases. The first one runs from 1820 to 1854 and is characterized by a continuous increase in the course of the German departures. Despite its strong development, German industry was indeed insufficient to absorb the growing population (24.9 million inhabitants in 1820; 33.7 millions in 1850), and overseas emigration represented an important safety valve for excess labor force. Even though there were several political exiles, notably after the revolution of 1848-1849, the majority of emigrants were *"peasants with solemn faces, workers with calloused hands, artisans with worried expressions – classes which had been little concerned with politics and with revolution not at all"* (Hansen, 1940, p.274). The peak years of German emigration were reached at the beginning of the 1850s, and were induced by the double movement of agricultural depression in Germany and gold rush in California.

Figure 1

Evolution of the German emigration rate: 1820-1914
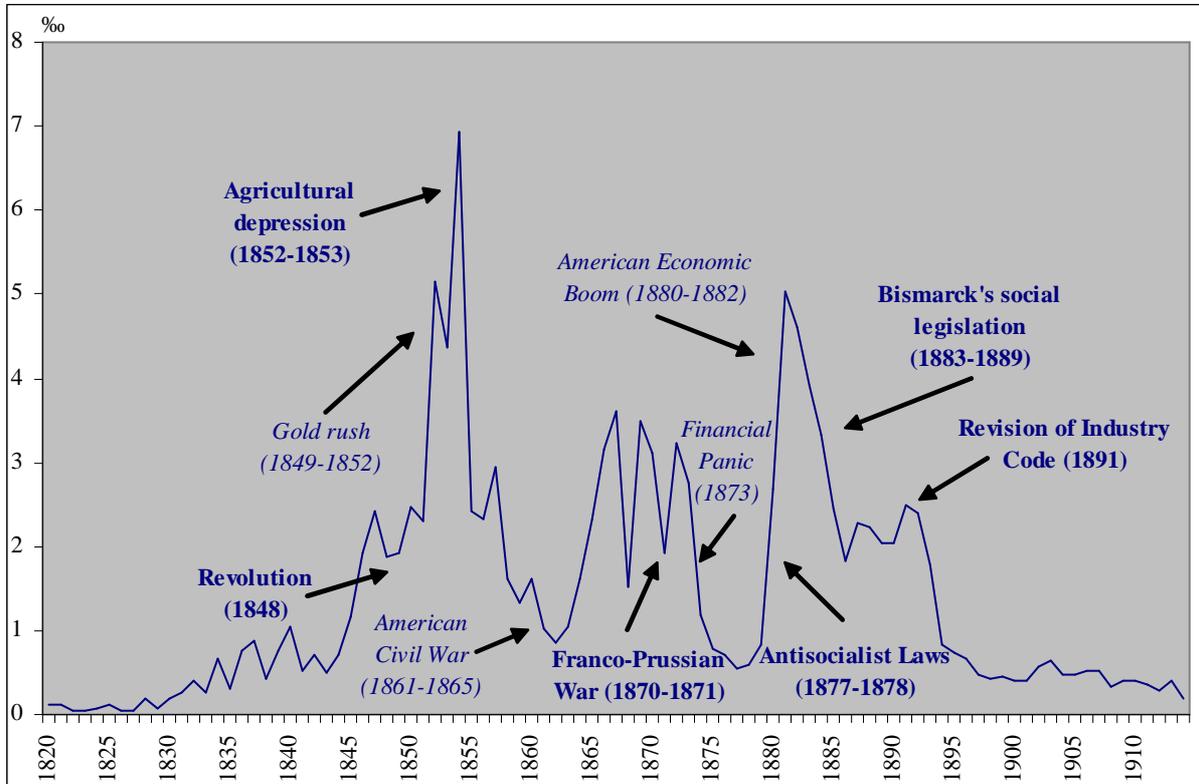
Notes: The emigration rate corresponds to the annual number of emigrants per thousand resident population. The explanations in bold refer to German causes, while the ones in italics are related with American factors.
Source: Ferenczi and Willcox (1929).

The second phase goes from 1854 to 1881-1882 and is marked by a strong volatility in the emigration rate. Thus, the American Civil War (1861-1865) produced a severe fall in German emigration (0.85‰ in 1862), but after 1865, emigration rates quickly returned to earlier levels (3.15‰ in 1866 and 3.60‰ in 1867). The Franco-Prussian War, as for it, temporarily interrupted the transatlantic flow ("only" seventy six thousand emigrants in 1871 *versus* more than one hundred twenty thousand in 1870 and 1872), even though not in the same proportion that the Panic of 1873. Caused by the collapse of Jay Cooke's Northern Pacific Railroad, the latter indeed set up a five-year depression that brought about a sharp drop in the emigration rate (2.76‰ in 1873; 0.54‰ in 1877). Afterwards, emigration from the German States surged in the late 1870s/early 1880s in a small part due to the Bismarck's Antisocialist Laws, and in a large part as a consequence of the American economic boom.

Only between 1880 and 1882, about five hundred forty thousand Germans landed on American soil.

Eventually, the 1881-1882 years were the last ones with high levels of emigration rate (more than 4‰) and were followed by a stage of fast decrease in the rhythm of outflows. This third period runs until World War I. Actually, Germany was one of the few European countries that recorded structural drops of the emigration rate before World War I. While most of the countries, in particular the southern and eastern European nations, resorted to mass emigration in the 1890s and 1900s, Germany presented, at the same time, one of the lowest levels of emigration rate (1‰ in average between 1885 and 1913) and the highest decrease between the 1865-1884 period and the 1885-1913 one (table 1).

Table 1

Comparison between the European emigration rates: 1865-1913

	1865-1884 (Average)	1885-1913 (Average)	Total change (%)
Germany	**2.47**	**1.01**	**-59**
Russia	4.30	2.84	-34
Ireland	13.77	9.69	-30
Switzerland	1.92	1.67	-13
United Kingdom	6.70	6.23	-7
Norway	6.95	6.52	-6
Denmark	2.49	2.70	+8
Sweden	4.67	5.43	+16
France	0.14	0.19	+31
Netherlands	3.14	5.04	+60
Belgium	2.26	3.71	+64
Portugal	2.75	5.90	+115
Spain	2.26	5.99	+165
Italy	3.56	12.25	+244
Austria	2.23	11.80	+430
Hungary	0.38	3.92	+945

Source: Author's calculations based on Ferenczi and Willcox (1929).

Who were the migrants?

The majority of candidates for emigration were young males, whose level of education was below the average. Thus, table 2 shows that during the period 1872-1913, 53.4% of German emigrants were males. This percentage was even higher (59.8%) for the persons

between twenty-one and fifty years. In other respects, statistics reveal that 57.5% of emigrants were more than twenty-one and less than fifty years old. Yet, it is likely that most of them were less than thirty years old. Actually, more general studies show that the average age of migrants before World War I was twenty (Easterlin, 1961; Gould, 1979; Hatton and Williamson, 1994a).

Table 2

Distribution of German emigrants by sex and age: 1872-1913

		1872-1883	1884-1893	1894-1903	1904-1913	Total
Under 14 years	Males	34136 *3.0%*	129430 *12.1%*	25723 *8.7%*	22429 *8.8%*	211718 *7.6%*
	Females	32899 *2.9%*	122657 *11.5%*	25272 *11.5%*	21546 *8.4%*	202374 *7.3%*
14-21 years	Males	102575 *8.9%*	108974 *10.2%*	29007 *9.8%*	21845 *8.5%*	262401 *9.5%*
	Females	95597 *8.3%*	101779 *9.5%*	31503 *10.6%*	20681 *8.1%*	249560 *9.0%*
21-50 years	Males	484220 *42.2%*	290747 *27.2%*	91802 *31.0%*	86012 *33.6%*	952781 *34.4%*
	Females	337535 *29.4%*	198039 *18.5%*	57157 *19.3%*	47080 *18.4%*	639811 *23.1%*
50 years and over	Males		29968 *2.8%*	7729 *2.6%*	5464 *2.1%*	43161 *1.6%*
	Females		31352 *2.9%*	9162 *3.1%*	5800 *2.3%*	46314 *1.7%*
All emigrants	Males	623525 *54.3%*	559877 *52.4%*	154346 *52.1%*	140840 *55.0%*	1478588 *53.4%*
	Females	465773 *40.6%*	454484 *42.5%*	123111 *41.6%*	98434 *38.4%*	1141802 *41.2%*
Total		1147947	1068425	296251	256242	2768865

Notes: Percentages are related to the total number of emigrants (last row). The sum of percentages is less than 100 due to the lack of information on some persons (sex not distinguished and/or age not stated).
Source: Ferenczi and Willcox, 1929.

German emigrants, as most of other migrants at the time, chiefly chose the United States as their country of destination. As a matter of fact, between 1871 and 1913, around 90% of them landed on the American soil (table 3). Next, came Brazil, although only 2% of Germans opted for this option. Then, Germans went to Argentina (0.85%), Canada (0.84%)

and Australia (0.80%). Very few of them chose Africa (0.47%) or Asia (0.10). It is noteworthy that the figures for Europe are probably underestimated, since there was no need to take a boat to travel to other European countries, and no passport or visa was required either. Therefore, many Germans could have moved from their country to another without having been taken into account by statistics on migration[1].

Table 3

Distribution of German emigrants by destination: 1871-1913

Areas of destination	Number of emigrants	%
Europe	8761	*0.31*
Canada	24022	*0.84*
U.S.	2578835	*90.64*
Brazil	56868	*2.00*
Argentina	24281	*0.85*
Other Latin America	26963	*0.95*
Africa	13278	*0.47*
Asia	2863	*0.10*
Australia	22763	*0.80*

Source: Ferenczi and Willcox (1929).

Table 4 compares the average distribution of German emigrants by occupation between 1899 and 1913 (first column) with the distribution of all the immigrants to the United States (included Germans) for the period 1896-1915 (column 2), and with the distribution of the Economically Active Population (EAP) in Germany in 1907 (column 3). Although the categories are not exactly the same for each distribution, some remarks can be made with regard to the specificities of German emigration. First of all, a significant part of emigrants belonged to agriculture and forestry (34.3% of all migrants), which is much more than the average of immigrants in the United States (19.6%). In the same way, German workers were overrepresented in mining, industry and building trade (33.1% as against 12.9% for U.S. immigrants). Yet, the two sectors together (67.4%) represented less than the distribution of the economically active population in Germany (77.8%). Indeed, industry was growing very fast during this period and agriculture needed arms, so it is not a surprise that the distribution

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[1] Most of statistics on migration before World War I are mainly statistics on intercontinental migration. Indeed migrants had to register, when they left, in the harbor of embarkation and, when they arrived, in the port of entry.

of emigrants was different from the distribution in German economy. On the contrary, transport and commerce constituted a more important share in the emigrants' distribution (14.5%) than in the EAP's distribution (10.5%). The share was also more important than for U.S. immigrants in general (3.6). But, the main difference with other migrants came from the domestic service. The share of domestic servants in German emigrants was only 8.6%, while it represented 34.7% of the overall immigration distribution. It is to be noted that 95% of German domestic servants were women. In total, German migrants went to the United States to work in what they used to do in Germany and there were little differences between the distribution by occupation for emigrants and for the rest of the German population. On the contrary, the distribution was very different from the rest of immigrants to the United States.

Table 4

Distribution by occupation: 1899-1913

German emigration: 1899-1913			U.S. immigration: 1896-1915			German EAP:1907		
1	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*
Agriculture, forestry	122	*34.3%*	Agriculture	2911	*19.6%*	Agriculture, forestry, fishing	9883	*36.8%*
Mining, industry, building trade	119	*33.1%*	Mining, industry	1910	*12.9%*	Mining, industry, construction	10985	*41.0%*
Transport, commerce	52	*14.5%*	Transport, commerce	526	*3.6%*	Transport, commerce	2826	*10.5%*
Domestic service, general labor	31	*8.6%*	Domestic service	5144	*34.7%*	Services	2976	*11.1%*
Wage-earners, various	4	*1.1%*						
Liberal professions, public services	10	*2.9%*	Liberal professions	169	*1.1%*			
No occupation or not specified	20	*5.5%*	Other occupations, none or unknown	4157	*28.1%*	Other occupied	153	*0.6%*
Total	358		Total	14819		Total	26823	

Notes: Sub-columns 1 correspond to the sector of activity. Sub-columns 2 show the number of persons in thousands. Sub-columns 3 represent the percentage of persons in each sector.
*Sources:* Emigration from Germany and Immigration to the U.S.: Ferenczi and Willcox (1929); German EAP: Bairoch (1968).

The limits of traditional explanations for the decrease in German emigration

Traditional analyses of international migration generally explain the decline in emigration putting the emphasis on the international wage convergence process (Hatton and Williamson, 1994b). The departure of a significant part of the labor force in emigration countries lessens competition in the domestic labor market, which entails an increase in the real wage level. On the contrary, the arrival of new immigrants means more competition in the receiving country's labor market and, therefore, it should foster a fall in real wages, or at least, a lower augment. The combined effects induce a reduction in the wage gap between sending and receiving countries, which in its turn contributes to the drop in migration movements. Yet, this analysis does not apply to the pre-1914 German case. Indeed, the wage ratio between the United States and Germany was remarkably stable before World War I, as shown by figures 2 and 3. Actually, after a period of strong volatility between 1850 and 1867, the wage ratio remained very stable. Thus, during the period 1867-1913, the variance of the wage ratio was equal to 0.005, and actually the wage ratio was exactly the same in 1913 than in 1867 (1.84). Therefore, it is unlikely that the decrease in German emigration was the consequence of the wage convergence.
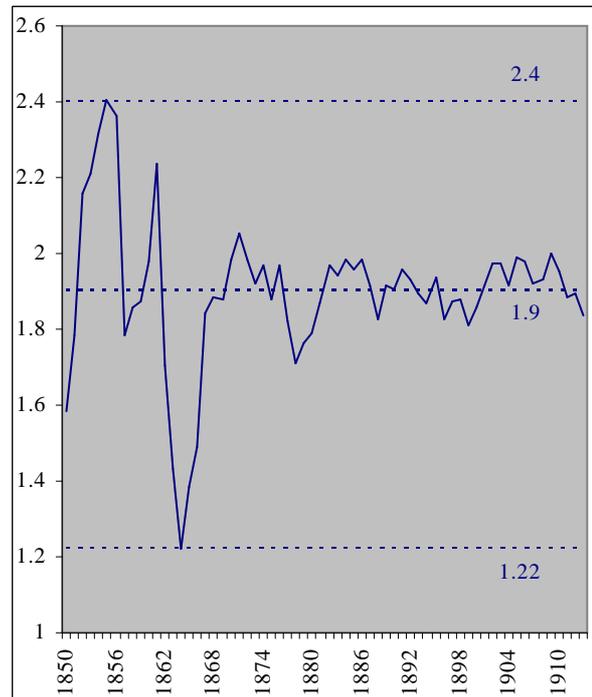
Figure 2

American and German real wages: 1850-1913
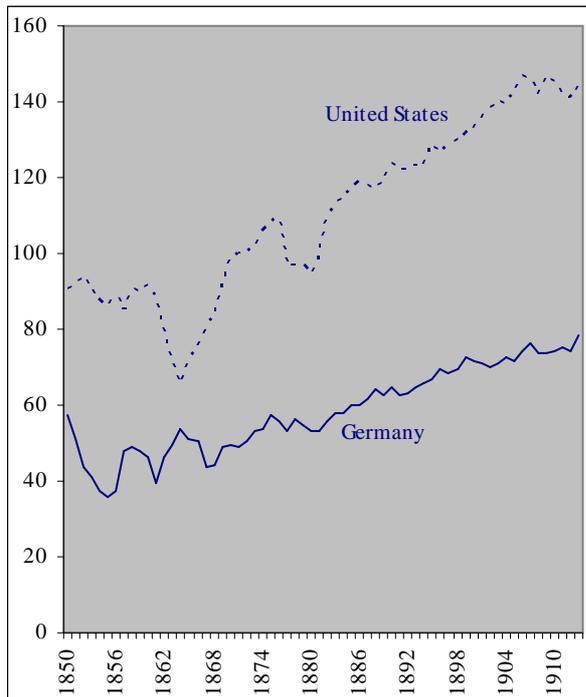
Note: Wages correspond to international real wages (100 = U.S. wages in 1871).
Source: Williamson (1995).

Figure 3

Real wage gap: 1850-1913

Notes: Wage gap = U.S. wages/German wages.
2.4 = maximum; 1.22 = minimum; 1.9 = mean.
Source: Author's calculations based on Williamson (1995).

Another explanation for the fall in emigration rates lies on the rapid industrialization of German economy in the second half of the nineteenth century: *'So tremendous was the absorptive capacity of German industry that after 1890 German agriculture experienced a labor shortage which was met only by the large scale importation of foreign labor for harvesting and other seasonal work"* (Jones, 1960, p.196). The growth of the German GDP was indeed impressive and this growing prosperity surely influenced the migration pattern of Germany. The need to go abroad to find a job was less pressing, and it is true that Germany became a labor-importing country at the end of the nineteenth century. Yet, industrialization does not totally explain the decrease in German emigration that occurred by the 1880s. The GDP growth in the U.S. was much higher than in Germany (figure 4) and, above all, the wage gap between both economies remained high, which means that there were still more opportunities to improve living conditions in America than in Germany. Besides, labor inflows were mainly steered towards German agriculture, which does not imply that there

were not unemployed persons anymore, but rather that workers were unwilling to move from industry to agriculture, since wage levels were lower in the latter[2].

Figure 4

Comparison between German and American GDP growth: 1870-1913
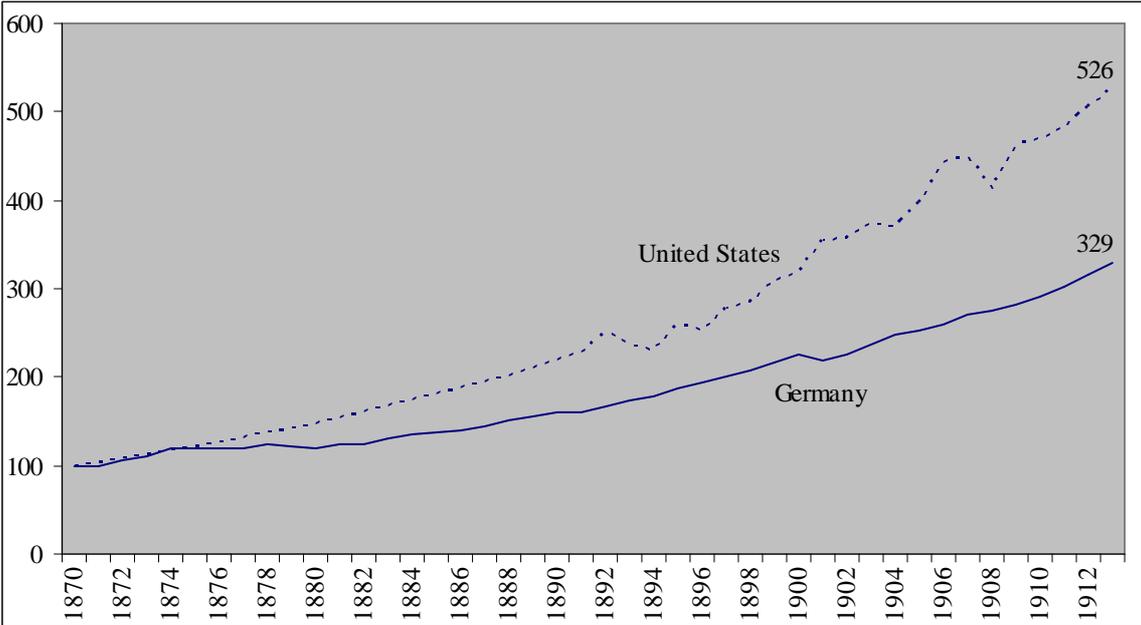
Note: 1870=100
Source: Author's calculations based on Maddison (2003)

As a complement to the previous argument is the demographic explanation. Indeed, the drop in German fertility at the end of the nineteenth century could have been at the origin of the emigration fall. Yet, as shown by figure 5, the German demographic transition really ended at the turn of the twentieth century, when the natural growth rate of the population began to structurally ebb (the natural growth rate reached its peak in 1902: 15.7‰). It is hence very unlikely that there was a direct link between the slowdown in the natural growth rate and the decrease in emigration, above all knowing that demographic changes affect emigration

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[2] There are not wage series for German agriculture before World War I. Yet, it does not seem hazardous to extend Bry's assertion for the 1920s to the pre-1914 German wage structure: *"It is worth noting that wages in agriculture were typically lower than those paid in manufacturing, mining, or transportation. At the end of 1929, cash and noncash wage rates per hour in agriculture averaged about 42 pfennigs for men and 27 pfennigs for women. This compares with averages of 67 and 47 pfennigs for unskilled men and women in the low-paying textile industry."* (Bry, 1960, p.111n).

movements with approximately a twenty-year lag (Easterlin, 1961; Gould, 1979; Hatton and Williamson, 1994a).

Figure 5

The natural growth rate of German population: 1830-1940
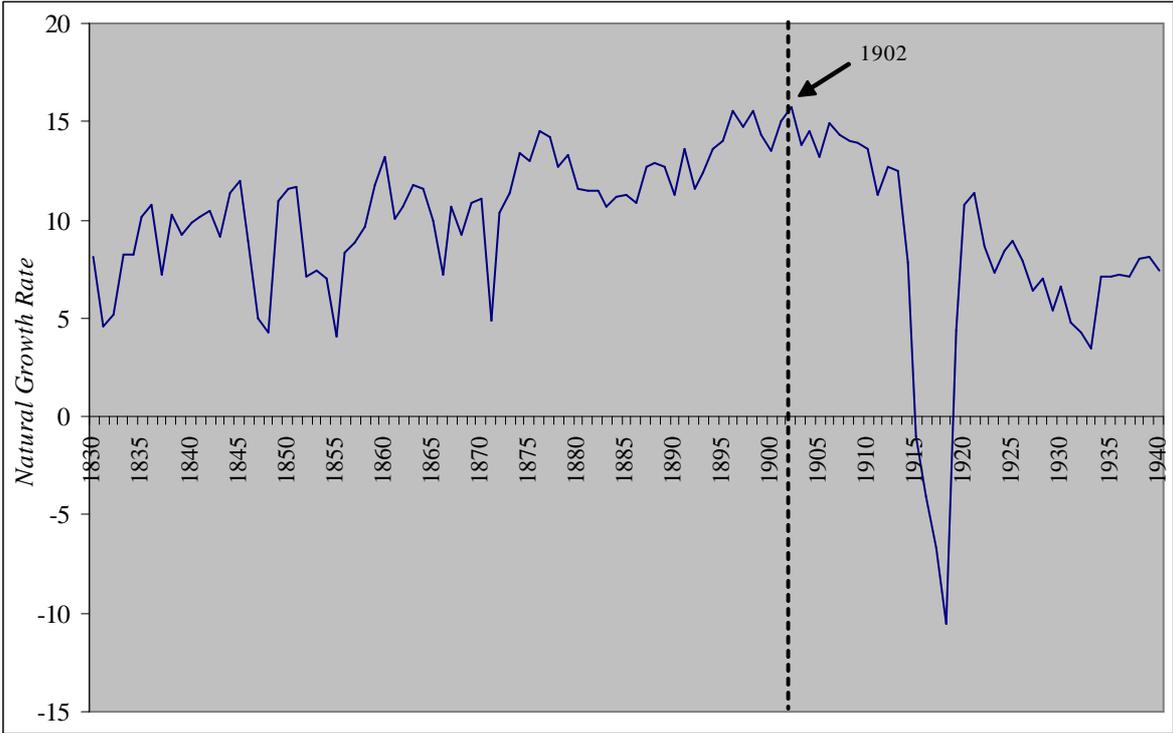
Note: The natural growth rate is the difference between the birth rate (number of birth per thousand population) and the death rate (number of death per thousand population). It does not include the net immigration rate.
Source: Author's calculations based on Statistisches Jahrbuch für das Deutsche Reich (several years).

Lastly, the decline of German emigration could have been the fruit of the competition with migrants from other places. Thus, Grant (2003) underlines that the increase in emigration in the eastern and southern European countries at the end of the nineteenth century brought about a strong competition between "old migrants" and "new migrants" in the American labor market. German workers would have particularly been affected insofar as their skill endowments were pretty much the same than the immigrants from eastern and southern Europe and as they tended to settle in the same states than new migrants. Although convincing, this explanation omits the impact of chain migration on the departure decision. Unlike eastern and southern candidates for emigration, German nationals benefited from the

advice and even financing assistance from the relatives who already lived on the other side of the Atlantic. It clearly constituted a comparative advantage for German migrants and competition with other migrants should have favored them and not the new migrants, who could not rest in the same way on the chain migration process.

It so appears that traditional explanations (decrease in the wage gap, industrialization, fall in the fertility or international competition) represent part of the answer to the puzzle of the decline of German emigration before World War I, but do not provide a sufficient framework to fully understand it. This is the reason why it seems necessary to go more deeply into the question, in particular by looking into the social legislation implemented by Bismarck during the 1880s. As a matter of fact, the combined effects of the German industrialization process and the war against France brought a new awareness of the importance of labor force both at the economic and military levels. Discussions on emigration to America arose during the last third of the nineteenth century: *"Governments, parliaments, scholars and writers, journalists and broad circles among the public saw emigration as a problem which they had to solve and on which they had to make their views known. This intensive preoccupation is evidenced by many attestations: books of advice, brochures, newspapers, novels, poems, songs, pictures, official files, proclamations and public pronouncements, placards, leaflets, etc."* (Moltmann, 1982, p.11). Consequently, public authorities began to change their attitude to emigration by trying to control it. Bismarck's social legislation, concurrently with other laws such as the broadening of land ownership, constituted part of the answer to this aim (Jones, 1960).

II – The Advances of the Bismarck's Social Legislation

The adoption of the first German's social insurance laws constituted the Bismarck's response to the growing movement of labor demands that accompanied the fast industrialization of German economy during the second half of the nineteenth century. In order to cut the ground from under the Social Democrat Party's feet, the German chancellor decided to develop an active social policy that would bring together the State and the working class: *"The policy of the state should cultivate the view also among the propertyless classes of the population, those who are the most numerous and the least educated, that the state is not only an institution of necessity but also one of welfare. By recognizable and direct advantages they must be led to look upon the state not as an agency devised solely for the protection of*

the better-situated classes of society but also as one serving their needs and interests." (Speech made by Bismarck in the Reichstag in 1881; quoted by Pinson, 1966, p.241).

With this aim in view, Bismarck carried out in less than a decade three important laws that established a full compulsory insurance system against the main threats: sickness, industrial accident, old age and invalidity. The first of these laws was adopted the 15th of June of 1883 and consisted of sickness insurance. All the industry's workers who earned less than two thousand reichsmarks per year benefited from an insurance paid, for two-thirds, by the workers themselves (according to their income) and, for one-third, by the employers. Sick workers were covered for medical treatment up to thirteen weeks, and received financial support equivalent to three-quarters of the average wage. The second law, passed the 6th of July of 1884, dealt with industrial accidents. The employers were under the obligation to pay the whole contributions. The accident victims did not have to prove anymore that the employer was responsible. In the case of permanent total disability, the workers could receive a periodical rent equivalent to two-thirds of their annual earnings; and in the event they died, the widows and orphans were paid compensation. The law was extended in 1886 in order to include farm workers. Finally, the third law, adopted the 22nd of June of 1889, was about old age and invalidity. It introduced a pension system that was financed partly by the government and partly (and equally) by the workers and the employers. Not only industrial workers, but also farm workers, craftsmen and servants were eligible for its benefits, irrespective of wage level. In 1911, the three compulsory insurance laws were consolidated in the so-called "National Insurance Code" and the pension insurance was extended to the salaried employees.

This new legislation was in line with the Prussian social tradition, which had put into place several social policies long before Bismarck's laws. Thus, coal-miners benefited from an advanced insurance system regulated by the 1776 *revidierte Klevisch-Märkische Bergordnung* that gave them : *"free spa cures, medical treatment in case of illness or accident, sick payments during the whole period of illness and invalid payments in case of permanent disablement."* (Tampke, 1981, p.72). In the same way, the Prussian government had introduced during the 1840s new forms of guilds for artisans and craftsmen that also covered factory workers. These guilds were in charge of managing illness, invalid and old age pensions funds for their members, while persons not covered by the guild funds could rely on insurance mechanisms implemented by a large number of local communities. Moreover, some successful firms of the nineteenth century, although not the majority, were concerned about the living conditions of their employees: *"Entrepreneurs such as Friedrich Harkort, Werner Siemens, August Borsig, Friedrich König, Alfred Krupp, and Karl Stumm sought to improve*

the circumstances of their workers by providing or fostering welfare chests, improved housing, better working conditions, higher-than-average pay, nurseries for working mothers, and the like. In return, they expected greater productivity, loyalty, discipline, no unions, and no strikes." (Pflanze, 1990, p.151).

The Bismarck's social legislation did not therefore constitute a radical change. It nevertheless brought significant advances for German workers: *"Poor relief, both with regard to the extent of its provisions and the sectors of the population it covered, was, as a matter of principle, strictly limited in scope. Social security, on the other hand, is an institution aimed at covering the entire population, and its growth is perhaps comparable to the extension of the franchise. Yet while the right to vote was extended downwards from the privileged classes to the less privileged ones, social security expanded upwards on the social ladder."* (Flora, 1981, p.358). The main results were notably in terms of health insurance. Indeed, even though sick payments did not represent 100 per cent of the normal daily wage, the workers received more than under the former Poor Law payments.

Tables 5 and 6 show the results of the sickness insurance system between 1885 and 1913. The share of insured workers in the economically active population significantly increased during the period from one quarter to almost one half: by 1913, there were around 13.6 million German workers who benefited from health insurance, compared to 4.3 millions in 1885. Concurrently, the level of expenditures swelled from 47.4 million marks in 1885 to 390.7 million marks in 1913. As a consequence, not only more people were covered, but the sickness insurance system became also more generous. Thus, the diseases lasted on average more time at the end of the period (20.6 days in 1913) than at the beginning (18.3 days in 1888), and the expenditures by cases of disease went up from 42.3 marks in 1888 to 80.5 marks in 1913, i.e. a growth by 90.3% (whereas the cost of living only rose by 25% during the same period).

Table 5

Sickness insurance (law of 1883): 1885-1913

Year	Economically Active Population	Insured workers	Cases of disease	Days on leave	Expenditures (marks)
1885	17613	4294			54139
1886	17866	4570			59994
1887	18166	4842			62142
1888	18489	5398	1620	29692	68549
1889	18818	6144	1843	33179	78101
1890	19134	6580	2632	39477	92352
1891	19449	6880	2064	40592	98621
1892	19753	6955	2782	42426	104833
1893	20048	7107	2843	42641	112635
1894	20398	7283	2185	47337	109682
1895	20796	7526	3010	46658	115513
1896	21247	7945	2781	47589	120080
1897	21736	8337	3001	51523	131948
1898	22238	8770	2982	53234	140740
1899	22744	9156	3479	60427	160477
1900	23224	9521	3713	64932	174923
1901	23722	9642	3664	66624	183174
1902	24259	9858	3549	67331	186699
1903	24777	10224	3783	71775	202262
1904	25285	10711	4177	83222	237108
1905	25791	11184	4474	88134	257317
1906	26295	11689	4442	87437	267177
1907	26814	12139	4956	97149	302655
1908	27324	12324	5206	103894	331050
1909	27838	12520	5046	103368	342200
1910	28348	13069	5197	104708	357391
1911	28932	13619	5772	115129	399377
1912	29296	13218	5634	112249	425596
1913	29659	13566	5710	117437	459889

Notes: All figures are in thousands. EAP is estimated by regression using total population data and EAP figures for some years. Expenditures exclude administrative costs.

Sources: Economically Active Population: author's calculations based on Bairoch (1968); other statistics: Statistisches Jahrbuch für das Deutsche Reich (several years).

Table 6

Statistics on sickness insurance

Year	Insured workers/ EAP (%)	Cases of disease/ insured workers	Days/ insured workers	Days/ cases of disease	Expenditures/ insured workers (marks)	Expenditures/ cases of disease (marks)	Expenditures/ Day (marks)
1885	24.38				12.61		
1886	25.58				13.13		
1887	26.66				12.83		
1888	29.20	0.30	5.50	18.33	12.70	42.33	2.31
1889	32.65	0.30	5.40	18.00	12.71	42.37	2.35
1890	34.39	0.40	6.00	15.00	14.04	35.09	2.34
1891	35.37	0.30	5.90	19.67	14.33	47.78	2.43
1892	35.21	0.40	6.10	15.25	15.07	37.68	2.47
1893	35.45	0.40	6.00	15.00	15.85	39.62	2.64
1894	35.70	0.30	6.50	21.67	15.06	50.20	2.32
1895	36.19	0.40	6.20	15.50	15.35	38.37	2.48
1896	37.39	0.35	5.99	17.11	15.11	43.18	2.52
1897	38.36	0.36	6.18	17.17	15.83	43.96	2.56
1898	39.44	0.34	6.07	17.85	16.05	47.20	2.64
1899	40.26	0.38	6.60	17.37	17.53	46.13	2.66
1900	41.00	0.39	6.82	17.49	18.37	47.11	2.69
1901	40.64	0.38	6.91	18.18	19.00	49.99	2.75
1902	40.64	0.36	6.83	18.97	18.94	52.61	2.77
1903	41.27	0.37	7.02	18.97	19.78	53.47	2.82
1904	42.36	0.39	7.77	19.92	22.14	56.76	2.85
1905	43.37	0.40	7.88	19.70	23.01	57.52	2.92
1906	44.45	0.38	7.48	19.68	22.86	60.15	3.06
1907	45.27	0.41	8.00	19.60	24.93	61.06	3.12
1908	45.10	0.42	8.43	19.96	26.86	63.59	3.19
1909	44.97	0.40	8.26	20.49	27.33	67.82	3.31
1910	46.10	0.40	8.01	20.15	27.35	68.77	3.41
1911	47.07	0.42	8.45	19.94	29.32	69.19	3.47
1912	45.12	0.43	8.49	19.92	32.20	75.54	3.79
1913	45.74	0.42	8.66	20.57	33.90	80.54	3.92

Note: Author's calculations based on table 5.
Sources: As for table 5.

The new accident mechanism contributed also to the improvement in workers' conditions. Its main results are presented in tables 7 and 8. Industrial accident was compulsory for all industrial workers outside cottage industry and handicrafts, and it was the responsibility of firms to get their employees insured, at least those who earned less than a certain income threshold. The threshold was 3000 marks a year in most of the associations (5000 marks from 1913 onwards). Unlike sickness insurance, virtually all of the economically active population was included in the accident insurance system (98.1% in 1913). Thus, by 1913, almost 30 million German workers were covered by the system (3.7 millions in 1886). In the same way, the level of expenditures dramatically increased from 1.9 million marks in

1886 to 176.6 million marks in 1913. This rise in the expenditures brought about a better coverage of the accidents. The share of recipients in total insured workers significantly increased during the period or, at least, until 1907 (afterwards the share slightly lessens until 1913). Furthermore, the level of annual expenditures by insured workers also grew in an auspicious way: 0.51 marks in 1886, 3.27 marks ten years later and finally 6.07 marks in 1913. It is noteworthy that it is not possible to deduce from the existing statistics the amount of expenditures by categories of accident: temporary injury, permanent accident or death.

Table 7
Accident insurance (law of 1884): 1886-1913

Year	Economically Active Population	Insured workers	Recipients	Accident (new recipients)	Permanent incapacity (new recipients)	Death	Death Insurance	Expenditures (marks)
1886	17866	3725	0.177	10.540	1.778	2.716	5.935	1915
1887	18166	4122	7.914	17.102	3.166	3.270	7.083	5933
1888	18489	10344	20.556	21.236	2.216	3.692	7.764	9692
1889	18818	13375	35.392	31.449	2.908	5.260	10.594	14489
1890	19134	13620	58.213	42.038	2.708	6.047	11.337	20351
1891	19449	18015	87.949	51.209	2.595	6.428	12.837	26471
1892	19753	18014	123.439	55.654	2.664	5.911	11.835	32395
1893	20048	18119	159.746	62.729	2.507	6.336	12.763	38279
1894	20398	18192	198.114	69.619	1.784	6.361	12.296	44501
1895	20796	18389	242.841	75.527	1.707	6.448	12.800	50442
1896	21247	17605	288.282	86.403	1.547	7.101	13.953	57654
1897	21736	17947	338.533	92.326	1.507	7.416	14.644	64591
1898	22238	18246	388.622	98.023	1.139	7.984	16.004	71733
1899	22744	18604	437.854	106.036	1.326	8.124	16.076	79284
1900	23224	18893	487.235	107.654	1.390	8.567	17.216	87352
1901	23722	18867	536.485	117.336	1.446	8.501	17.324	99301
1902	24259	19083	590.046	121.284	1.435	7.975	16.924	108133
1903	24777	19465	642.040	129.375	1.538	8.370	18.587	117913
1904	25285	19876	834.815	137.673	1.604	8.752	19.100	127309
1905	25791	20243	892.901	141.121	1.487	8.928	19.086	136148
1906	26295	20727	936.491	139.726	1.463	9.141	19.151	143161
1907	26814	21172	980.044	144.703	1.356	9.815	20.522	151091
1908	27324	27074	1008.677	142.965	1.160	9.856	20.544	157885
1909	27838	27167	1021.168	139.070	1.118	9.368	19.967	162266
1910	28348	27554	1017.570	132.064	1.072	8.857	18.651	164425
1911	28932	28027	1018.075	132.114	0.988	9.443	19.617	166611
1912	29296	28390	1014.122	137.089	0.909	10.300	20.956	170303
1913	29659	29104	1010.495	139.633	0.868	10.293	20.608	176638

Notes: All figures are in thousands. The column "recipients" corresponds to the stock of recipients while "new recipients" refers to the annual flow. Are considered "accidents" all injuries that last at least thirteen weeks. Recipients of "death insurance" were the widows and orphans. Expenditures exclude administrative costs.
Sources: As for table 5.

Table 8

Statistics on accident insurance

Year	Insured workers/ EAP (%)	Recipients/ Insured workers (%)	New recipients/ insured workers (%)	Expenditures/ insured workers (marks)
1886	20.85	0.005	0.28	0.51
1887	22.69	0.19	0.41	1.44
1888	55.94	0.20	0.21	0.94
1889	71.07	0.26	0.24	1.08
1890	71.18	0.43	0.31	1.49
1891	92.63	0.49	0.28	1.47
1892	91.20	0.69	0.31	1.80
1893	90.38	0.88	0.35	2.11
1894	89.18	1.09	0.38	2.45
1895	88.43	1.32	0.41	2.74
1896	82.86	1.64	0.49	3.27
1897	82.57	1.89	0.51	3.60
1898	82.05	2.13	0.54	3.93
1899	81.80	2.35	0.57	4.26
1900	81.35	2.58	0.57	4.62
1901	79.53	2.84	0.62	5.26
1902	78.66	3.09	0.64	5.67
1903	78.56	3.30	0.66	6.06
1904	78.61	4.20	0.69	6.41
1905	78.49	4.41	0.70	6.73
1906	78.82	4.52	0.67	6.91
1907	78.96	4.63	0.68	7.14
1908	99.08	3.73	0.53	5.83
1909	97.59	3.76	0.51	5.97
1910	97.20	3.69	0.48	5.97
1911	96.87	3.63	0.47	5.94
1912	96.90	3.57	0.48	6.00
1913	98.13	3.47	0.48	6.07

Note: Author's calculations based on table 7.
Sources: As for table 5.

The invalidity system, adopted at the same time than the old age system (1889), was for the persons hit by a serious illness (different from an accident) that did not allow them to work anymore. Even though the level of pensions was relatively low in comparison with wage earnings (about 18% of the average wage), it constituted genuine means of support for people who otherwise would not have other solution than to beg to live. The results of the invalidity system can be found in table 9. The annual number of recipients was higher than for the accident insurance and it increased with time (+74.7% between 1902 and 1913). Likewise, the amount of the pension grew by 72.2% between 1891 and 1913 (compared with an increase in the cost of living by 22.7%). In total, spending in invalidity went up from 5.4 million marks in 1894 to 167.3 million marks in 1913.

Table 9

Invalidity insurance (law of 1889): 1891-1913

Year	EAP (thousand)	Insured workers (thousand)	Insured workers/EAP	Recipients (thousand)	New recipients (thousand)	Amount pension (marks)	Expenditures (million marks)
1891	19449					113.5	1.3
1892	19753					114.7	2.6
1893	20048					118.0	4.1
1894	20398					121.2	5.4
1895	20796					124.1	8.4
1896	21247					126.7	11.6
1897	21736	11813	54.35			128.7	15.1
1898	22238					130.8	19.4
1899	22744					131.6	24.1
1900	23224					142.0	53.6
1901	23722					146.3	65.0
1902	24259			629.7	142.8	149.7	78.6
1903	24777			727.7	152.9	152.3	92.8
1904	25285	13756	54.40	803.2	140.1	155.1	105.3
1905	25791	13948	54.08	857.8	122.9	159.5	114.3
1906	26295	14143	53.78	891.7	111.0	162.9	121.0
1907	26814	14958	55.78	926.8	112.2	166.0	126.7
1908	27324	15226	55.72	958.8	116.9	170.3	132.9
1909	27838	15444	55.48	983.4	115.3	174.8	139.3
1910	28348	15660	55.24	1008.2	114.7	176.9	145.6
1911	28932	15878	54.88	1036.9	118.2	180.1	151.3
1912	29296	16099	54.95	1065.7	124.8	187.0	158.6
1913	29659	16324	55.04	1099.8	134.2	195.4	167.3

Notes and sources: As for table 5.

The old age insurance system was probably less interesting than the other systems. By 1901, the level of pensions was even lower than for invalidity pensions and the widows and orphans did not receive anything once the recipient died. Above all, the workers could take advantage from their old age pensions only when they reached their seventieth year. The consequence was that, in that period of low life expectancy, very few people could really enjoy their pension. Thus, as shown by table 11, about one third of the Germans who died after fifteen did it after seventy (31.8% in 1901; 37.4% in 1913), which means that most of the workers could not enjoy their old age pensions. Besides, half the persons who lived until seventy died before seventy-eight, i.e. that retired people received their pension on average during eight years. Moreover the share of insured workers in the economically active population remained stable (54.4% in 1897; 55% in 1913), while the number of recipients

decreased between 1902 and 1913. Lastly, the amount of the pension did not rise significantly between 1891 and 1913 (only 34.7%) and total spending strongly increased until 1900 (26.2 million marks as against 14.4 million marks in 1894), but declined afterwards (13.7 million marks in 1913). Notwithstanding all these imperfections, old age insurance, as other insurance systems, represented a real improvement in the economicconditions of German workers.

Table 10

Old age insurance (law of 1889): 1891-1913

Year	EAP (thousand)	Insured workers (thousand)	Insured workers/EAP	Recipients (thousand)	New recipients (thousand)	Amount pension	Expenditures (million marks)
1891	19449					124.0	
1892	19753					127.3	
1893	20048					129.4	
1894	20398					125.6	14.4
1895	20796					131.8	15.6
1896	21247					133.4	16.2
1897	21736	11813	54.35			135.8	16.3
1898	22238					138.0	16.3
1899	22744					141.6	16.0
1900	23224					145.5	26.2
1901	23722					150.4	24.7
1902	24259			1923.4	128.9	153.0	23.5
1903	24777			1809.8	124.3	155.4	22.1
1904	25285	13756	54.40	1685.5	119.4	157.2	20.9
1905	25791	13948	54.08	1561.6	106.9	159.1	19.5
1906	26295	14143	53.78	1447.7	106.7	160.8	18.4
1907	26814	14958	55.78	1364.2	108.1	161.6	17.3
1908	27324	15226	55.72	1278.7	109.9	163.2	16.4
1909	27838	15444	55.48	1196.4	110.0	163.6	15.5
1910	28348	15660	55.24	1139.7	116.1	164.3	15.0
1911	28932	15878	54.88	1099.2	115.9	165.3	14.5
1912	29296	16099	54.95	1054.8	121.1	166.1	14.1
1913	29659	16324	55.04	1019.8	119.1	167.0	13.7

Notes and sources: As for table 5.

Table 11

Death statistics: 1901-1913

Year	Death rate (‰)	People dying before 15 (as a % of total deaths)	People dying after 70 (as a % of total deaths)	People dying after 70 (as a % of people dying after 15)	Number of years of life after 70 (median)
1891	23.4			*27.01*	
1892	24.1			*26.21*	
1893	24.4			*25.87*	
1894	22.3			*28.25*	
1895	22.1			*28.48*	
1896	20.8			*29.96*	
1897	21.3			*29.39*	
1898	20.6			*30.18*	
1899	21.5			*29.16*	
1900	22.1			*28.48*	
1901	20.7			*30.07*	8
1902	19.4	47.23	16.77	31.78	8
1903	20.0	49.03	16.17	31.72	8
1904	19.6	48.04	16.51	31.77	8
1905	19.8	47.48	16.91	32.20	8
1906	18.2	47.01	16.78	31.67	8
1907	18.0	43.97	18.47	32.96	8
1908	18.1	44.34	18.43	33.11	8
1909	17.2	43.62	18.51	32.83	7
1910	16.2	38.76	21.98	35.89	8
1911	17.3	45.87	16.54	30.56	7
1912	15.6	36.07	23.98	37.51	8
1913	15.0	36.91	23.60	37.41	8

Notes: The death rate is the number of deaths per thousand population. Before 1902, the share of people dying after 70 in the population dying after 15 is estimated by regression using the death rate and later statistics.
Source: Statistisches Jahrbuch für das Deutsche Reich (several years).

The three 1880s' social insurance laws were complemented after 1890 by a series of measures aiming at the protection of labor and the improvement in working conditions. Thus, in 1891, the industry code (*Gewerbeordnung*) was revised: Sunday work was prohibited in industry and restricted to five hours in trade; the truck system, under which workers received part of their remuneration in kind, was banned; employers had to respect minimum sanitary conditions; working hours for women and youths were legally limited… (Bry, 1960). In the same way, child labor was severely restrained by a 1903 law. Moreover, although there was no national unemployment insurance until 1927, several German towns, following the example of Cologne in 1894, put into place a local system of unemployment benefits. Municipalities and private agencies were also in charge of housing, public works and the relief of migratory workers (Pinson, 1966). Eventually, a system of labor exchanges was

implemented at the beginning of the twentieth century in order to help unemployed workers to find jobs more straightforwardly.

Was the German social legislation a "free lunch"?

Transfer mechanisms are supposed to reduce productivity and hence to deter economic growth. Yet, Lindert (2004) abundantly showed that the Welfare State has had no major impact on the long term growth. In that sense, it is possible to consider social spending as a "free lunch", since social benefits do not have significant economic costs. Now, is this analysis consistent with the German experience? Did the implementation of the Bismarck's social legislation imply a cost in terms of economic growth or did it represent a "free lunch"?

The main costs of the 1880s' social legislation were related to the development of the contributions to the insurance system. Thus, the employers were the main contributors (table 12). Between 1885 and 1913 they paid almost half the contributions (44.7%), while the employees paid 40% and the State only 5.4%. The remaining of the contributions (10%) corresponds to interest earned on previous years' surpluses. Employers were in charge of the industrial accident system, while the employees had to pay the biggest part of the sickness mechanism. In absolute value (table 13), total contributions increased during the period by 1450%, i.e. an average annual rise by 10.3%. But the increase was higher for the employers (+2581% in total; +12.5% on annual average) than for the employees (+963% in total; +9.2% on annual average).

Table 12

Distribution of the contributions to the social insurance system

	Employers	Employees	State	Interest
Sickness (1885-1913)	30.2%	65.4%	0%	4.5%
Accident (1886-1913)	87.7%	0%	0%	12.3%
Old age and invalidity (1891-1913)	34.4%	34.4%	15.8%	15.3%
Total	44.7%	39.9%	5.4%	10%

Note: The distribution corresponds to the share that the main agents had to pay on average during the whole period.
Source: Author's calculations based on Statistisches Jahrbuch für das Deutsche Reich (several years).

Table 13

Amount of the contributions: 1885-1913

Year	Sickness		Accident	Invalidity		
	Firms	Workers	Firms	Firms	Workers	State
1885	18639.1	40364.1				
1886	20654.9	44729.4	2301.2			
1887	21394.2	46330.4	7128.3			
1888	23600.1	51107.5	11644.7			
1889	26888.7	58229.3	17408.7			
1890	31794.8	68853.6	24452.0			
1891	33953.1	73527.6	31804.8	9947.1	9947.1	4568.7
1892	36092.0	78159.5	38922.7	14560.9	14560.9	6687.9
1893	38778.1	83976.4	45991.4	18218.1	18218.1	8367.6
1894	37761.4	81774.7	53467.9	22636.0	22636.0	10396.8
1895	39768.8	86121.9	60605.7	27749.3	27749.3	12745.3
1896	41341.1	89526.8	69270.3	33367.6	33367.6	15325.8
1897	45427.1	98375.2	77605.0	38940.6	38940.6	17885.5
1898	48454.0	104930.3	86186.5	44822.3	44822.3	20587.0
1899	55249.1	119645.3	95259.3	51139.4	51139.4	23488.4
1900	60222.3	130415.2	104952.1	60288.9	60288.9	27690.8
1901	63063.2	136567.4	119309.3	68443.3	68443.3	31436.1
1902	61516.2	137507.9	125663.3	69492.9	69492.9	37849.7
1903	66479.1	146845.5	135263.6	73138.3	73138.3	41854.7
1904	79413.6	172566.4	148250.7	77043.9	77043.9	45275.6
1905	87102.1	187692.4	157822.8	80645.9	80645.9	47350.8
1906	97294.9	207337.2	166973.6	85063.1	85063.1	48757.6
1907	106262.3	225273.1	171561.4	89321.6	89321.6	49620.6
1908	114913.9	236220.2	181596.5	92211.2	92211.2	50521.8
1909	120973.3	248562.3	198981.3	94219.3	94219.3	51500.6
1910	129832.7	267670.4	199920.3	98677.0	98677.0	52538.2
1911	140454.0	288976.9	196842.1	104902.8	104902.8	53283.1
1912	152414.3	311161.5	192764.0	136709.3	136709.3	55069.3
1913	160709.4	326313.3	194680.6	144976.3	144976.3	58526.1

Notes: All figures are in thousand marks.
Source: Statistisches Jahrbuch für das Deutsche Reich (several years).

It is noteworthy that despite the social legislation, the weight of the German State did not significantly augment before World War I. As shown by table 14, the raise in social expenditures as a percentage of GDP between 1881 and 1913 was 64%, which, compared with Norway (+86%), the United Kingdom (+121%), Italy (+175%), France (+145%) and Belgium (+373%), was relatively limited. In the same way, the increase in German social expenditures between 1881 and 1891, that is, just before the first social law and just after the third one, was only 12%, i.e. less than one percent per year. Above all, the level of social spending was not higher than for the rest of European countries: 4.1% of GDP in 1913, as against 4.2% in the United Kingdom, 4.9% in France (1912), and 7.1% in Belgium (1910). The main reason was that the German social system was essentially private and, on that

account, the financial participation of the government was very low: *"Unlike today, German taxpayers contributed almost nothing in the 1880s. Rather, the costs of insurance were borne by the workers themselves and by theirs employers. For workers' accident and sickness insurance, the subsidies were essentially zero. In the case of old-age and invalidity insurance, the state paid only 6 percent of all insurance revenues as of 1891 and still only 18 percent as late as 1908."* (Lindert, 2004, p.174).

Table 14

Social expenditures in Europe: 1870-1913

|	Belgium	France	Germany	Italy	Norway	Sweden	United Kingdom
1872	1.2 (1870)	2.1	**1.9**	0.2	0.2	0.9 (1870)	/
1881	1.5 (1880)	2.0 (1880)	**2.5**	0.4	0.7	1.1 (1880)	/
1891	1.2 (1890)	1.2 (1890)	**2.8**	0.4	0.8	1.2 (1890)	1.9 (1890)
1900	2.9	2.0 (1900)	**3.0**	0.5	1.2	1.1 (1897)	2.7
1906	/	2.3	**3.1**	0.7	1.2	/	3.5 (1905)
1910	7.1	4.0 (1909)	**3.9**	0.9	1.4	/	4.2
1913	/	4.9 (1912)	**4.1**	1.1	1.3	0.8	4.2
% change (1881-1913)	*+373 (1880-1910)*	*+145*	***+64***	*+175*	*+86*	*-27*	*+121 (1890-1913)*

Note: Social expenditures are measured as a percentage of GDP. They include social security, public health and housing expenditures; they exclude education expenditures.
Source: Flora (1983)

This lack of financial participation of the State does not mean that its role was not important. On the contrary, it contributed to implement the system and to coordinate the action of the involved agents: *"The achievement of the Bismarck's famous innovations in social insurance consisted of his sweeping away most of the transactions costs of getting a settlement among hundreds of firms and millions of workers. Without his political maneuvering, there could have been long delays in setting up Germany's comprehensive insurance systems."* (Lindert, 2004, p.174). As a result, the impact of the contributions on the German economy was limited since all the firms had to adopt the system at the same time. Therefore, the risk of free riding was very low and the repercussions in terms of

competitiveness between German firms were virtually nil. The consequence is that the Bismarck's social legislation does not seem to have restrained the economic activity. The GDP was growing very fast (+3.1% on annual average between 1885 and 1913) and foreign investment was more attracted by Germany than by other European economies (see figure 6).

Figure 6

**Investment income balances in Europe: 1880-1913**
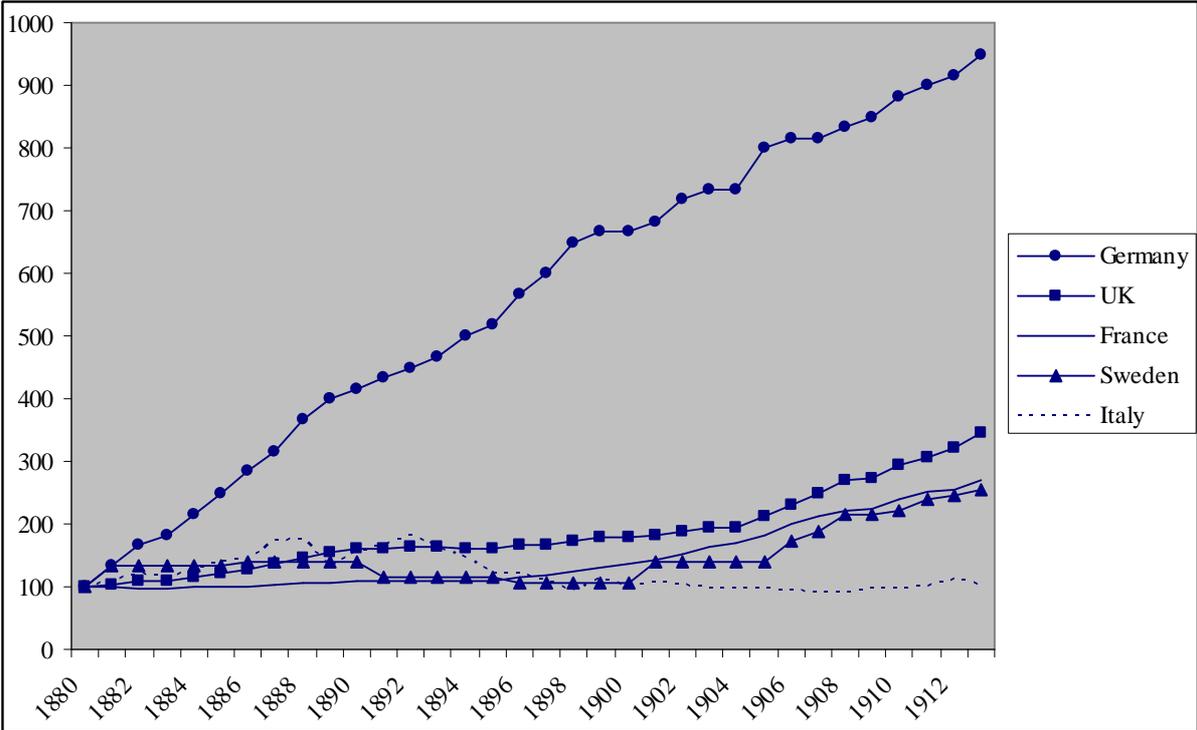
Note: 1880=100. Investment income balances are given in current prices.
Source: Author's calculations based on Mitchell (2003).

This lack of negative effects in terms of economic activity can be explained by the positive impact of social insurance on the workers' health, that is, on human capital and hence on productivity. Actually, the productivity increased faster than wages. Thus, figure 7 illustrates the course of GDP per capita and real wages in Germany between 1880 and 1913. It clearly appears that the rhythm of growth was higher for the GDP per capita than for the real wages, which implies that the firms kept the main part of the added value. In that sense, it may be possible to talk about an implicit contract between employers and employees. The firms agreed to pay the contributions to the insurance system knowing that their employees

would be in good health and would therefore be more productive. Workers, as for them, accepted the fact that the increase in their wages was limited, since they knew that they benefited from social benefits. The upshot was that the losses of the insurance system were relatively low, which explains that Bismarck's measures did not have significant impact on the long term growth and the attractiveness of the German economy.

Figure 7

GDP per capita and real wages in Germany: 1880-1913
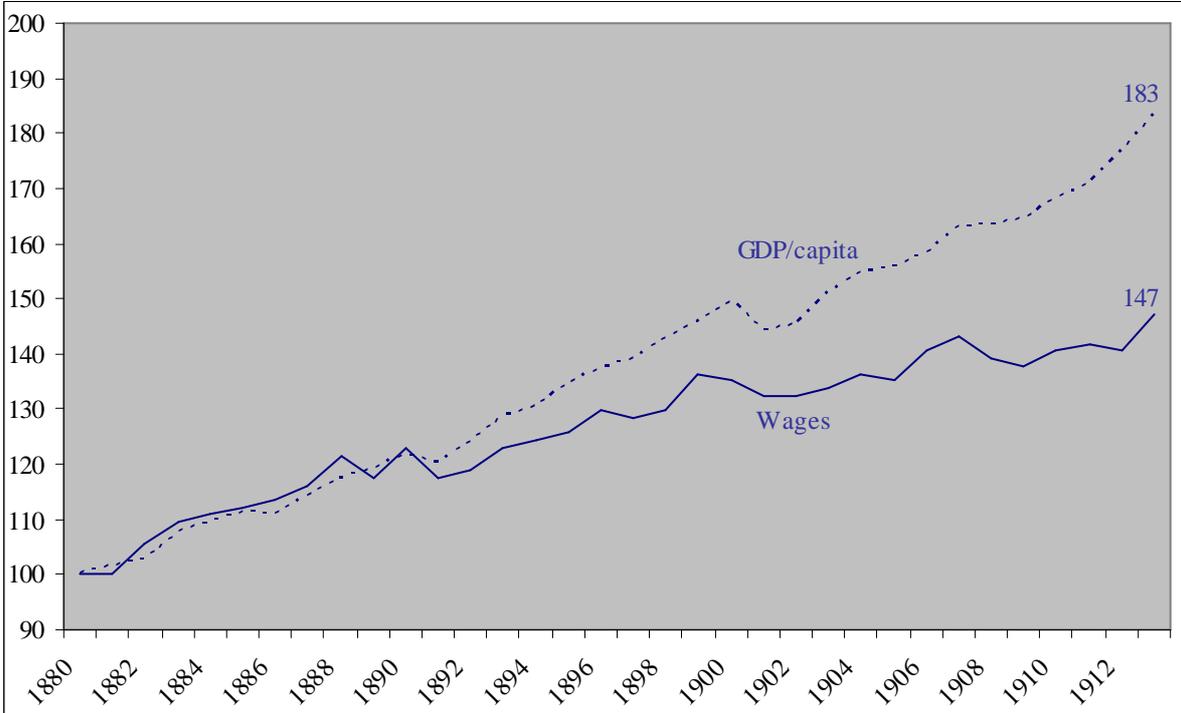
Note: 1880=100
Source: GDP/capita: Maddison (2003); Real wages: Williamson (1995).

In the meantime, in the United States…

While European countries were inspired by the Bismarck's scheme to set up their own social insurance system even before World War I, the implementation of social programs in the United States was tardy. American authorities, in the name of both economic liberalism and social Darwinism, considered that their country did not need any social intervention since national and immigrant workers could benefit from a large number of jobs, as well as high

wage rates: *"In such a pioneer country, there was naturally a widespread general belief that anyone – no matter how poor his start – could get full security and even wealth for himself and his children."* (Myers, 1965, p.11). It is only when the Great Depression began that opinions changed and that first social measures could be adopted. Before that: *"The care of the poor of all ages was a responsibility assumed primarily by the private sector, generally through the extended family, friends and neighbors, and organized private charity."* (Weaver, 1987, p.503).

Confronted with the lack of health insurance programs, American workers got organized and, from the 1870s, created mutual associations, whose purpose was to provide their members with sickness and/or life insurance. Although employers sometimes contributed to these mutual associations, the bulk of the costs lay on the shoulders of the employees, who generally lost their benefit rights when they left the firm. In the same way, some trade unions, in particular, railway unions, paid sick benefits to their members. But it was the minority of them. Above all, the amount of the benefits was both low (on average, five dollars a week) and restricted in time (thirteen weeks), which can be explained by the difficulty in getting members to finance a more generous system (Millis and Montgomery, 1938). In that sense, unlike in Germany, the optional nature of the system did not allow a significant expansion of the system, at least until the 1930s.

Actually, before the enactment of the Social Security Act in 1935, the only real organized insurance mechanisms were the workmen's compensation systems, which were established under state legislation. These systems aimed at covering workers against industrial accidents. Yet, their scope was very limited, above all before World War I. The most significant measure was adopted in 1910 by the State of New York. It consisted of a law that required the employers of twelve dangerous occupations to pay compensation, at rate set in the law, in case of an accident produced by "a necessary risk or danger of the employment or one inherent in the nature thereof." (Millis and Montgomery, 1938). Following New York State, twenty-two other states enacted workmen's compensation laws between 1911 and 1914. But it was only in the 1920s and 1930s that the system really expanded and that the "social responsibility" of the employer was widely recognized. Besides, the compensation laws did not immediately bring about a development of insurance. Indeed, most of the employers chose not to insure, with the common upshot that, due to the employer's inability to pay, the compensation provided for was not forthcoming. Insurance only became compulsory in the 1930s either through private insurance companies or by insurance in state funds.

Old age was probably the main problem of American workers before the implementation of the New Deal. According to Amstrong (1932, p.381), the only way to deal with it, was *"to leave this world early before the period of superannuation set in."* In a more prosaic way, the persons who were too old to work but too young to die frequently had no other option than charity, either private or public. Actually, wages were usually too low to permit workers to save in the long run, while pensions and insurance were costly or simply unavailable to industrial workers. As a matter of fact, private pensions really developed during the 1920s. The only private insurance mechanism that commonly existed before World War I was life insurance, and it represented a small share of total personal savings: 8.2%, on average, between 1897 and 1913 (U.S. Department of Commerce, 1975). As for public pensions, the first bills were introduced in 1903 in Massachusetts, but they were not passed, as many other old age pension laws at the time (Costa, 1998). In 1915, Alaska was the first state to adopt a pension system, but it was necessary to wait until 1923 before other states enacted a similar legislation. In 1935, the Social Security Act eventually implemented a federal scheme of old age pensions.

In total, the level of protection of American workers against the main threats was very low before the Great Depression and virtually inexistent before World War I. On the contrary, the German social legislation was growing quickly and, by 1913, most of the workers were covered by the social insurance mechanisms. The major upshot of such a discrepancy in social conditions was that lights of America did not shine with the same intensity than before, which probably explains why German emigration dramatically decreased before World War I.

III – Social Welfare and Labor Mobility: A Theoretical Framework

How do social benefits affect emigration?

Most of the studies that deal with the determinants of international migration put the emphasis on the wage gap between sending and receiving countries. Thus, Williamson (1996) shows how the wage convergence that accompanied the mass migration phenomenon played a great part in slowing down labor mobility between Europe and the New World countries, even before World War I. Other determinants of migration flows in economic analyses include the demographic structure and the level of industrialization of origin countries, differences in employment opportunities between countries, or still the so-called chain migration process.

Eventually, migration policies are taken into account, above all to explain why international movements dramatically declined after World War I, or why migration streams between developing and developed countries are much lower than what they should be given the income differential.

But, economic literature on international migration barely mentions the weight of social benefits in the emigration process. Kirk (1946), for instance, whose study on the behavior pattern of European population during the interwar period includes a chapter on the slowdown of labor mobility, refers to public intervention in social issues: *The introduction of social insurance also probably acted as a deterrent in the more industrialized countries. People who have the security of unemployment insurance, old age pensions, and other forms of advanced social legislation are naturally loath to jettison them for a speculative advantage in a foreign land"* (Kirk, 1946, p.88). In the same way, Gemery (1994) tries to establish how social insurance in sending countries could have affected labor flows in the interwar years: *"When coupled with the prospect of higher probabilities of unemployment that might well accompany an international move, this factor may have been determining in migrant decision-making."* (Gemery, 1994, p.187). But Kirk and Gemery seem to represent an exception in the economic history horizon. And even for them, the question of social insurance was not a central issue.

Yet, it is reasonable to believe that the development of Welfare States in Western countries has been accompanied by a decrease in the incentives to migrate. Indeed, the existence of social policies probably expands the opportunity cost of moving and brings about a slowdown in labor outflows. It is likely, for instance, that unemployment benefits deter job searchers from migrating since such benefits represent a substitute to the wages they could earn abroad. Thanks to unemployment benefits, they can afford to wait that economic conditions at home improve without the necessity of crossing borders to find another job. In the same way, the implementation of a pension system implies that workers do not need to save money for their old age. Therefore, it is rational for them to agree to receive lower wages during their working life in anticipation of the pensions they will receive when they retire. Likewise, programs such as health or accident insurance contribute to the drop in emigration insofar as their existence means that affected workers will receive financial compensations while they are away, whereas they know that if they move to a country where such measures do not exist, they run the risk of losing everything in case of an accident.

In that sense, social insurance constitutes a kind of indirect wages that candidates for migration might take into account in their income expectations both at home and abroad: the
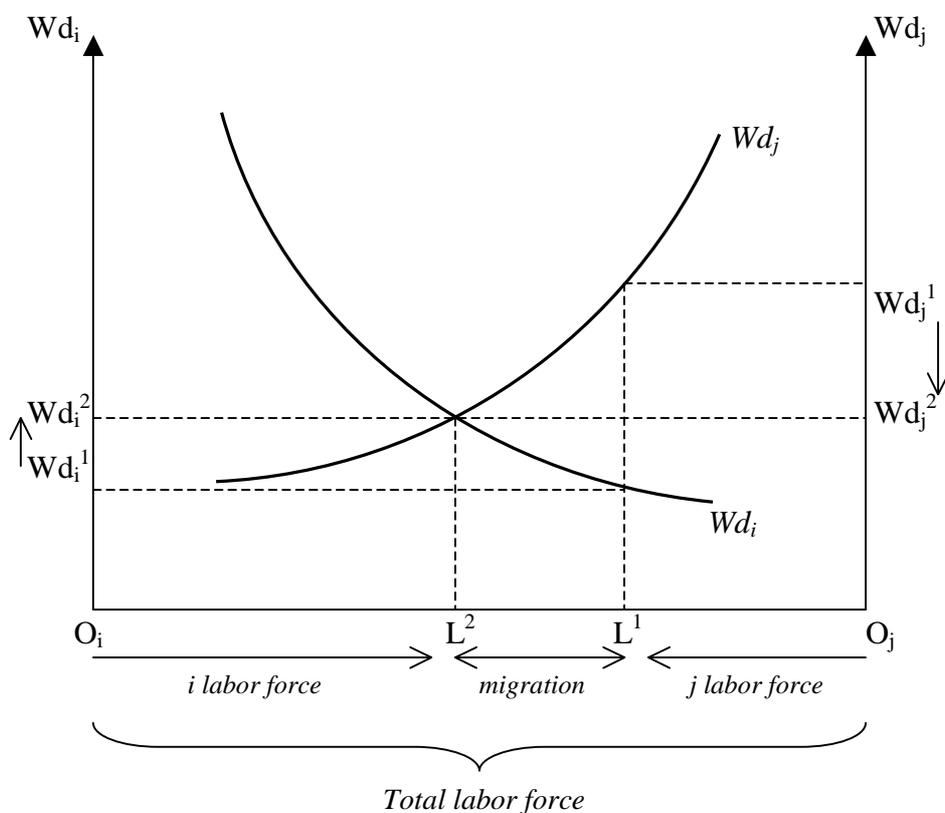
higher the domestic indirect wages, the lower the emigration rate. Therefore, what really matters in the wage gap between sending and receiving countries is the sum of direct and indirect wages, that is to say the combination of labor earnings and social benefits. It is noteworthy that the fact to know if social benefits are the product of private insurance or public subsidies is not really important, since in both cases the results for the workers are the same: on the one hand, they receive lower direct wages than in the countries that do not have social programs (because they have to pay either compulsory social contributions or additional taxes); on the other hand, they derive benefit from social insurance mechanisms (either public or private) that workers in other countries do not have.

Eventually, the development of welfare benefits contributes to the reduction in emigration, insofar as it increases the opportunity cost of moving abroad. Indeed, risk adverse agents would prefer to receive direct wages relatively low at home, provided that they know for sure that they are shielded against the main risks, rather than to have the possibility to earn high wage levels in another country, but without the guarantee to find a job and without the same degree of social insurance. In particular, it is very probable that the introduction of unemployment benefits gives a rise to the emigration slowdown, since the risk of not finding a job abroad is strengthened by the security given by the unemployment benefits at home. Of course, the higher the level of unemployment insurance (either by the amount of replacement wages or the duration of the payments), the lower the incentives to migrate.

A graphic illustration

Figure 8 illustrates the impact of direct wage differentials on labor mobility between two countries: *i* and *j*. The x-axis shows the total labor force of both countries. The workers employed in country *i* are measured from the left, and *j* workers from the right. Both y-axes correspond to real direct wages, which are given by marginal product of labor. Left axis represents *i* direct wages, while right axis shows *j* direct wages. Suppose that real direct wages in countries *i* and *j* are, respectively, Wd_i^1 and Wd_j^1, with Wd_j^1 higher than Wd_i^1. Initially, labor force in *i* is O_iL^1 and labor force in *j* is L^1O_j, but the wage gap between both countries attracts workers from *i* to *j*. Labor mobility between *i* and *j* will occur until the wage gap disappears, that is to say when Wd_i^2 is equal to Wd_j^2. At that point, the new labor force distribution is O_iL^2 and L^2O_j, and the total labor flow between *i* and *j* corresponds to L^2L^1.

Figure 8

Impact of direct wage differentials on labor mobility

Wd_i Wd_j

Wd_j

Wd_j^1

Wd_i^2 Wd_j^2

Wd_i^1

Wd_i

O_i L^2 L^1 O_j

i labor force   *migration*   *j labor force*

Total labor force

Now, how can social mechanisms be taken into account in this analysis? As seen previously, social benefits may be considered as indirect wages. Therefore, total wages are the sum of direct and indirect wages, and what is really important in the decision to migrate is not the direct wage gap, but rather the total wage gap. Figure 9 shows the effects of social benefits on labor mobility between Germany and the United States. The latter does not offer social insurance[3], which means that American total wages (Wt_{us}) are equal to the direct ones (Wd_{us}). On the contrary, German total wages (Wt_{ger}) stand above direct wages (Wd_{ger}), due to the social laws implemented in the 1880s. Without such measures, it is likely that German emigration to the United States would have been higher (L^2L^1) than what it really was (L^3L^1), since real direct wages in Germany before World War I remained much lower than American wages (see figures 2 and 3). In that sense, taking into account social reforms allows to understand why German emigration at the end of the nineteenth century and at the beginning

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[3] A seen in section II (*"In the meantime, in the United States…"*), the level of American social insurance before World War I, either public or private, was virtually inexistent. As a result, we assume that indirect wages in the U.S. are nil.

of the twentieth was so low, despite relatively high levels of wage differentials between the United States and Germany.

Figure 9

Effects of Bismarck's social legislation on migration flows

Incidentally, figure 9 helps to provide an explanation for the lack of convergence between American and German direct wages before World War I. As seen previously, without social insurance, labor mobility from Germany to the United States would probably have been L^2L^1 and direct wage convergence would have been full $\left(Wd_{ger} = Wd_{us}\right)$. But in reality, the migration level was only L^3L^1, which implied the persistency of a direct wage gap between the two countries $\left(Wd_{ger}^{2} < Wd_{us}^{2}\right)$. Insofar as workers take into account expected total wages in both countries, this direct wage gap is not as important as before. Eventually, this analysis can explain why all the workers do not move to countries with higher levels of wage rates. Social benefits matter in their decision. In that sense, Bismarck's social legislation was

probably at the origin of both the drop in German emigration rates from the 1880s onwards, and the lack of direct wage convergence between the United States and Germany.

A model of emigration in Welfare States

The following model, albeit applied to international labor mobility, is largely inspired by Todaro's model (1969) on the determinants of internal migration between rural and urban areas in the developing countries[4]. Indeed, its two key elements are the comparative attractiveness of the sending and receiving countries and their relative employment opportunities. Moreover, the model rests on the one developed by Hatton and Williamson (1998). The specificity of the current analysis is that it takes into account social benefits and their impact in terms of migration flows.

Let's assume that the probability that an individual *i* decides to migrate (P_i) depends on the difference between the expected utilities in the sending (domestic) and receiving (foreign) countries. Such utilities are respectively a function of the domestic (Y_s) and foreign (Y_r) incomes. Therefore, the probability of migration can be written:

$$P_i = Eu(Y_r) - Eu(Y_s) \qquad [1]$$

The individual's utility function is given by $u(Y) = \log(Y)$. Hence:

$$P_i = E\log(Y_r) - E\log(Y_s) \qquad [2]$$

As underlined by Todaro, the expected income depends on total real wages *(W)* and on the probability of finding a job *(E)*:

$$E(Y) = W \cdot E \qquad [3]$$

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[4] The Todaro's model lies on the assumption that migration is the result of differences in expected rather than actual earnings. In that sense, migrants consider the different labor market opportunities available and select the one that maximizes their expected gains from migration. Expected gains are measured by the difference in real incomes between rural and urban areas and the probability of a new migrant finding an urban job. In a full employment environment the decision to migrate would practically depend on the sole wage differential between urban and rural areas.

Suppose now that workers benefit from such advantages as sickness, accident and invalidity insurance, unemployment benefits or retirement pensions. In that case, it is necessary to make a distinction between direct wages (Wd), i.e. the conventional acceptation of the wage notion, and indirect wages (Wi), which include the "social remuneration" as listed above. In other terms, the decision to migrate depends not only on the wage level paid by the firms, but also on the side benefits received by the workers. Therefore, total real wages are given by:

$$W_s = S \cdot Wd_s^{\alpha} \cdot Wi_s^{1-\alpha} \qquad [4]$$

$$W_r = R \cdot Wd_r^{\beta} \cdot Wi_r^{1-\beta} \qquad [5]$$

where S and R are coefficients positive and above 1, $0<\alpha<1$, and $0<\beta<1$.

Thus, the probability of migration is:

$$P_i = \log\left(S \cdot Wd_r^{\beta} \cdot Wi_r^{1-\beta} \cdot E_r\right) - \log\left(R \cdot Wd_s^{\alpha} \cdot Wi_s^{1-\beta} \cdot E_s\right) \qquad [6]$$

where E_r is the probability to find a job in the receiving country and E_s is the probability of finding a job in the sending country.

Letting lowercase letters represent logarithms, this may be rewritten:

$$P_i = (r - s) + (\beta \cdot wd_r - \alpha \cdot wd_s) + \left[(1-\beta)wi_r - (1-\alpha)wi_s\right] + (e_r - e_s) \qquad [7]$$

Consequently, the decision to migrate will depend on the gap between real direct wages in the receiving and the sending countries $(\beta \cdot wd_r - \alpha \cdot wd_s)$, on the differences in the employment opportunities in each country $(e_r - e_s)$, and also on the dissimilarities between the social benefits, or indirect wages, provided by both countries $\left[(1-\beta)wi_r - (1-\alpha)wi_s\right]$. In that case, the existence of a significant wage gap and good employment prospects in the foreign country will not always bring about an increase in labor mobility, since the candidates for migration will also consider advantages related to the implementation of social policies.

The decision for an individual i to migrate at time t (P_{it}^e) might take into account the future values of the expected utility in the sending and receiving countries. Assume that the aggregate emigration rate (N_t) is a function of the average value of the probability of emigration across individuals $(N_t \approx \overline{P_{it}^e})$ and that today expectations about future utilities are based on past values $(P_{it}^e = \lambda P_{it} + \lambda^2 P_{it-1} + \lambda^3 P_{it-2} + \dots\dots + \lambda^n P_{it-(n-1)})$. Therefore:

$$N_t = (1-\lambda)P_{it} + \lambda N_{t-1} \qquad [8]$$

Hence, from equations 7 and 8, we obtain the following model:

$$N_t = (1-\lambda)[(r-s) + (\beta \cdot wd_r - \alpha \cdot wd_s) + [(1-\beta)wi_r - (1-\alpha)wi_s] + (e_r - e_s)] + \lambda N_{t-1} \qquad [9]$$

Now, can this model confirm the existence of a link between social welfare and international migration? It is the purpose of the following section to answer this question by applying it to the German case for the period 1872-1913.

IV – The Repercussions of Social Insurance Mechanisms on German Emigration

Gross and net direct wages

Before estimating German indirect wages, it is necessary to understand how direct wage series is built. As a matter of fact, the calculation of indirect wages hinges on the way direct wages are estimated. For that, we chose to rely on Desai (1968), whose method seems both transparent and trustworthy. Between 1871 and 1886, annual money wages correspond to a weighted average of six main industries: printing, building, coal-mining, machines, cotton textiles and steel. The employment in these industries in 1882 is being used for weighting. Sources include Däbritz (1934), Kuczynski (1947) and Bry (1960). From 1887 onwards, calculations are based on average earnings in industry, transport and distribution. In total, twenty-seven sectors are taken into account. Desai focuses on the wages of the workers that benefited from insurance against industrial accidents. Indeed, the system was administered by associations in charge of reporting not only the number of insured workers, but also their

incomes. Insurance contributions were proportional to the annual earnings of the insured employees, and Desai derives average wages from 1887 to 1913 by dividing total earnings in each industry by the number of insured persons. Then, he calculates a weighted average of all complete series, by using the number of insured workers. The result of this operation is presented in column 2 (table 15): annual money wages.

In the same way, Desai estimates the cost of living before 1871 and 1913. Insofar as nominal wages refer to industry, the cost of living is basically based on urban prices. It consists of an index of the average cost of consumed goods. Weights are given by the average expenditure proportions of thirteen families with incomes under 1200 marks a year, obtained from a national budget inquiry held in 1907 and 1908. The average income of the heads of these families (929 marks) corresponds to the average earnings of insured workers (925 marks in 1907; 939 marks in 1908). The budget inquiry covered twenty-seven cities as well as three suburbs of Berlin. Estimates of incomes and spending were compiled from 852 families with incomes below 3000 marks and with three to five children. The sources of the component price series are statistics collected by the Imperial government, the state governments and local authorities. The cost-of-living index is presented in column 3 (table 15).

Real wages are calculated using the statistics of money earnings and cost of living. They are given in prices of 1871 (column 4, table 15). Then, in order to make a comparison with American wages, we calculate German real wages in terms of American wages (100 = 1871). In that perspective, we take the international benchmark used by Williamson (1995). The results of calculations are given in column 5 (table 15). Finally, column 6 (table 15) shows German international real wages, such as calculated by Williamson (1995). The correlation coefficient between both series is 0.984.

Eventually, table 16 shows the repercussions of contributions that workers had to pay on direct wages. Nominal contributions correspond to the ratio of insured workers to the economically active population time the ratio of the total amount of contributions to the number of insured workers, that is, the ratio of the contributions to the German EAP. In that sense, total contributions represent the weighted average of contributions for sickness insurance, and invalidity and old age insurance (as seen in section II, employees did not have to contribute to the industrial accident insurance system). Net direct wages are given by the difference between direct wages and the contributions.

Table 15

German direct wages: 1871-1913

(1)	(2)	(3)	(4)	(5)	(7)
Year	Annual money wages (marks)	Cost of living (100=1871)	Real wages (prices of 1871)	Real wages (100=U.S. wages in 1871)	Williamson's series (100=U.S. wages in 1871)
1871	493	100	493	44.20	49
1872	605	109	557	50.17	50
1873	688	114	604	54.13	53
1874	668	116	578	51.96	54
1875	650	107	610	54.66	57
1876	596	103	580	52.37	56
1877	559	101	551	49.39	53
1878	561	95	593	52.98	56
1879	543	93	581	52.32	55
1880	545	98	554	49.68	53
1881	556	98	566	50.68	53
1882	591	97	609	54.32	56
1883	578	95	612	54.91	58
1884	584	94	623	55.24	58
1885	581	93	623	56.23	60
1886	580	92	628	55.98	60
1887	626	92	677	60.64	62
1888	615	92	669	59.60	64
1889	625	98	637	57.17	62
1890	649	97	672	60.01	65
1891	654	100	654	58.69	62
1892	652	99	658	59.20	63
1893	674	95	707	63.13	65
1894	659	95	695	62.22	66
1895	665	95	704	63.11	67
1896	699	94	741	66.87	69
1897	738	97	765	68.88	68
1898	756	98	770	69.47	69
1899	793	96	824	74.18	73
1900	784	101	780	70.04	72
1901	808	101	798	72.30	71
1902	805	102	789	70.57	70
1903	813	102	796	71.41	71
1904	828	102	810	72.87	73
1905	849	106	799	71.79	72
1906	895	109	823	73.60	74
1907	932	112	831	74.60	76
1908	947	115	827	73.82	74
1909	951	117	816	73.58	74
1910	979	117	834	74.61	74
1911	1008	118	851	76.29	75
1912	1056	124	851	76.13	74
1913	1083	123	883	79.69	79

Sources: see explanation above.

Table 16

German net direct wages: 1871-1913

Year	Direct wages	Nominal contributions			Real contributions	Net direct wages
		Sickness	Accident	Total		
1871	44.20					44.20
1872	50.17					50.17
1873	54.13					54.13
1874	51.96					51.96
1875	54.66					54.66
1876	52.37					52.37
1877	49.39					49.39
1878	52.98					52.98
1879	52.32					52.32
1880	49.68					49.68
1881	50.68					50.68
1882	54.32					54.32
1883	54.91					54.91
1884	55.24					55.24
1885	56.23	2.29		2.29	0.22	56.01
1886	55.98	2.50		2.50	0.24	55.74
1887	60.64	2.55		2.55	0.25	60.39
1888	59.60	2.76		2.76	0.27	59.33
1889	57.17	3.09		3.09	0.28	56.89
1890	60.01	3.60		3.60	0.33	59.68
1891	58.69	3.78	0.51	4.29	0.39	58.31
1892	59.20	3.96	0.74	4.69	0.43	58.77
1893	63.13	4.19	0.91	5.10	0.48	62.65
1894	62.22	4.01	1.11	5.12	0.48	61.74
1895	63.11	4.14	1.33	5.48	0.52	62.59
1896	66.87	4.21	1.57	5.78	0.55	66.32
1897	68.88	4.53	1.79	6.32	0.59	68.29
1898	69.47	4.72	2.02	6.73	0.62	68.85
1899	74.18	5.26	2.25	7.51	0.70	73.48
1900	70.04	5.62	2.60	8.21	0.73	69.30
1901	72.30	5.76	2.89	8.64	0.77	71.53
1902	70.57	5.67	2.86	8.53	0.75	69.82
1903	71.41	5.93	2.95	8.88	0.78	70.63
1904	72.87	6.82	3.05	9.87	0.87	72.01
1905	71.79	7.28	3.13	10.40	0.88	70.92
1906	73.60	7.88	3.23	11.12	0.91	72.69
1907	74.60	8.40	3.33	11.73	0.94	73.66
1908	73.82	8.65	3.37	12.02	0.94	72.88
1909	73.58	8.93	3.38	12.31	0.95	72.63
1910	74.61	9.44	3.48	12.92	0.98	73.63
1911	76.29	9.99	3.63	13.61	1.03	75.26
1912	76.13	10.62	4.67	15.29	1.10	75.03
1913	79.69	11.00	4.89	15.89	1.17	78.52

Notes: Details of calculation are given in section IV. Real wages and contributions: 100 = U.S. real wages in 1871

Indirect wages

Insofar as social benefits depend on personal conditions, it is difficult to precisely determine what the level of indirect wages is. The fact to work in a dangerous place, for instance in a coal mine, increases the probability of suffering an injury, which tends to raise the benefits from accident insurance. But, at the same time, the likelihood of reaching the retirement age diminishes. On the contrary, an office worker is generally less prone to meet with an accident, which lessens the dividends of accident insurance, while his probability of receiving an old age pension is higher than miners' one. Therefore, indirect wages vary not only with the level of direct wages, but also with the occupation and the localization. In order to cope with such a difficulty, the calculation of indirect wages lies on the average level of expenditures by insured workers.

It seems indeed reasonable to think that most of the German candidates for emigration were persons covered by the new social insurance scheme. As shown by Sánchez-Alonso (2000) and Hatton and Williamson (1998), the migrants were not rich, but they were not the poorest either. Indeed, without some minimum level of financial conditions, it was very difficult to undertake to move abroad. On the other hand, the wealthiest workers generally did not need to migrate, since it was very hard for them to improve their conditions in a foreign country. Now, insured workers in Germany were in the same conditions than candidates for migration. The poorest persons did not have a formal work and hence did not have access to social insurance, while the richest workers were not covered by the system, since there was an income threshold for the sickness and insurance mechanisms. This is the reason why we consider that the candidates for emigration are insured workers. This assumption is reinforced by the fact that direct wages, as seen previously, are calculated by taking into account the workers insured against industrial accidents. Therefore, the calculation of indirect wages also applies to them.

Thus, German indirect wages $\left(Wi_{ger}\right)$ can be measured as the sum of the ratio of expenditures by category of insurance to the number of insured workers in each category:

$$Wi_{ger} = \frac{Exp_{sick}}{Ins_{sick}} + \frac{Exp_{acc}}{Ins_{acc}} + \frac{Exp_{old.inv}}{Ins_{old.inv}}$$

where Exp_{sick}, Exp_{acc} and $Exp_{old.inv}$ represent, respectively, the level of expenditures for sickness insurance, accident insurance and old age and invalidity insurance, and Ins_{sick}, Ins_{acc} and $Ins_{old.inv}$ correspond to the number of insured workers for each class of insurance. The results of these calculations are presented in table 17. Table 18, as for it, presents German total wages, that is, the sum of direct and indirect wages.

Table 17

German indirect wages: 1885-1913

(1)	(2)	(3)	(4)	(5)	(6)
Year	Sickness	Accident	Old Age and Invalidity	Nominal indirect wages	Real indirect wages
1885	12.61			12.61	1.43
1886	13.13	0.51		13.64	1.54
1887	12.83	1.44		14.27	1.62
1888	12.70	0.94		13.63	1.55
1889	12.71	1.08		13.79	1.48
1890	14.04	1.49		15.53	1.68
1891	14.33	1.47	1.46	17.26	1.81
1892	15.07	1.80	2.10	18.97	2.02
1893	15.85	2.11	2.59	20.55	2.25
1894	15.06	2.45	3.16	20.67	2.28
1895	15.35	2.74	3.80	21.89	2.43
1896	15.11	3.27	4.47	22.86	2.56
1897	15.83	3.60	5.07	24.50	2.67
1898	16.05	3.93	5.74	25.72	2.77
1899	17.53	4.26	6.40	28.19	3.09
1900	18.37	4.62	7.39	30.39	3.18
1901	19.00	5.26	8.22	32.48	3.40
1902	18.94	5.67	9.19	33.80	3.47
1903	19.78	6.06	10.10	35.94	3.69
1904	22.14	6.41	10.78	39.33	4.05
1905	23.01	6.73	11.34	41.08	4.06
1906	22.86	6.91	11.74	41.50	3.99
1907	24.93	7.14	11.56	43.63	4.09
1908	26.86	5.83	11.92	44.61	4.07
1909	27.33	5.97	12.24	45.55	4.12
1910	27.35	5.97	12.57	45.88	4.09
1911	29.32	5.94	12.84	48.11	4.26
1912	32.20	6.00	12.75	50.94	4.30
1913	33.90	6.07	13.38	53.34	4.59

Notes: Sickness $= \dfrac{Exp_{sich}}{Ins_{sick}}$; Accident $= \dfrac{Exp_{acc}}{Ins_{acc}}$; Old age and invalidity $= \dfrac{Exp_{old.inv}}{Ins_{old.inv}}$.

Nominal indirect wages: Sickness + Accident + Old age and invalidity; Real indirect wages: 100 = U.S. realwages in 1871.

Sources: Author's calculations based on Statistisches Jahrbuch für das Deutsche Reich (several years).

Table 18

German total wages: 1871-1913

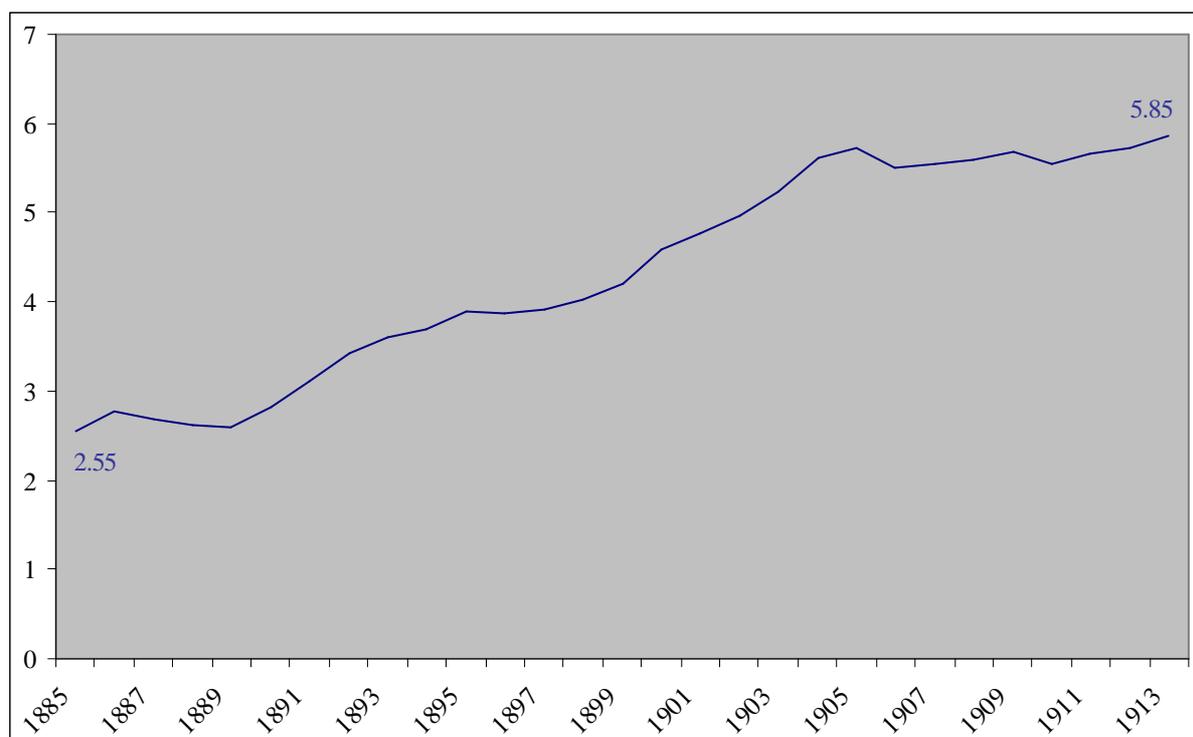| Year	Net direct wages	Indirect wages	Indirect wages/net direct wages	Total Wages
1871	44.20			44.20
1872	50.17			50.17
1873	54.13			54.13
1874	51.96			51.96
1875	54.66			54.66
1876	52.37			52.37
1877	49.39			49.39
1878	52.98			52.98
1879	52.32			52.32
1880	49.68			49.68
1881	50.68			50.68
1882	54.32			54.32
1883	54.91			54.91
1884	55.24			55.24
1885	56.01	1.43	2.55%	57.44
1886	55.74	1.54	2.76%	57.28
1887	60.39	1.62	2.68%	62.01
1888	59.33	1.55	2.61%	60.88
1889	56.89	1.48	2.60%	58.36
1890	59.68	1.68	2.82%	61.36
1891	58.31	1.81	3.11%	60.12
1892	58.77	2.02	3.43%	60.79
1893	62.65	2.25	3.59%	64.90
1894	61.74	2.28	3.70%	64.02
1895	62.59	2.43	3.88%	65.02
1896	66.32	2.56	3.86%	68.88
1897	68.29	2.67	3.92%	70.96
1898	68.85	2.77	4.02%	71.62
1899	73.48	3.09	4.20%	76.56
1900	69.30	3.18	4.58%	72.48
1901	71.53	3.40	4.75%	74.93
1902	69.82	3.47	4.96%	73.29
1903	70.63	3.69	5.23%	74.33
1904	72.01	4.05	5.62%	76.05
1905	70.92	4.06	5.73%	74.98
1906	72.69	3.99	5.49%	76.68
1907	73.66	4.09	5.55%	77.74
1908	72.88	4.07	5.58%	76.95
1909	72.63	4.12	5.68%	76.76
1910	73.63	4.09	5.56%	77.72
1911	75.26	4.26	5.66%	79.52
1912	75.03	4.30	5.73%	79.33
1913	78.52	4.59	5.85%	83.11

Notes: 100 = U.S. real wages in 1871. Total wages are the sum of net direct wages and indirect wages.

Sources: Net direct wages: table 16; indirect wages: table 17.

Were social insurance mechanisms implemented in Germany before World War I sufficient to deter German workers from moving abroad? Actually, it can be argued that the weight of social benefits was very limited. As shown in table 18 and illustrated by figure 10, the share of indirect wages in total wages was on average 4.33% and eventually reached 5.85% only in 1913.

Figure 10

Share of indirect in direct wages: 1885-1913

Note: The ratio measures indirect wages as a percent of direct wages.
Source: table 18.

Yet, beyond the figures of indirect wages, which are inevitably subject to discussion, the fact remains that there was a strong and fast reaction to the new social legislation. Thus, table 19 shows the evolution of German emigration rates after the adoption of the three 1880s social insurance laws. It is striking to notice the strong drop in emigration that followed each law, in particular the sickness and industrial accident programs, which had direct effects on

the living conditions of the German workers. The old age and invalidity mechanism, as for it, had fewer repercussions since, as underlined previously, rare were the potential beneficiaries of the pension system.

Table 19
### Social insurance and German emigration

Social insurance law	Emigration rate			Growth rate
t	*t-1*	*t*	*t+1*	*(t+1/t-1)*
1883 (Sickness)	4.62	3.91	3.33	-27.9%
1884 (Industrial accident)	3.91	3.33	2.44	-37.5%
1889 (Old age and invalidity)	2.23	2.04	2.04	-8.7%

Source: Author's calculations based on Ferenczi and Willcox (1929)

In a general way, figure 11 seems to confirm the link between the implementation of the social legislation and the fall of German emigration. The increase in indirect wages from 1885 onwards was accompanied by a strong decrease in the emigration rate (2.44‰ in 1885; 0.40‰ in 1913), and the coefficient of correlation between both variables was high: -0.84. The rapid decline of the emigration rate after 1891 could also be explained by the reform of the industry code in 1891 (see section II). Indeed, the progress in working conditions (limitation of working hours, improvement in sanitary conditions, banishment of the truck system, etc.) certainly contributed to reduce the incentives to migrate.

Figure 11

Indirect wages and emigration rate: 1885-1913
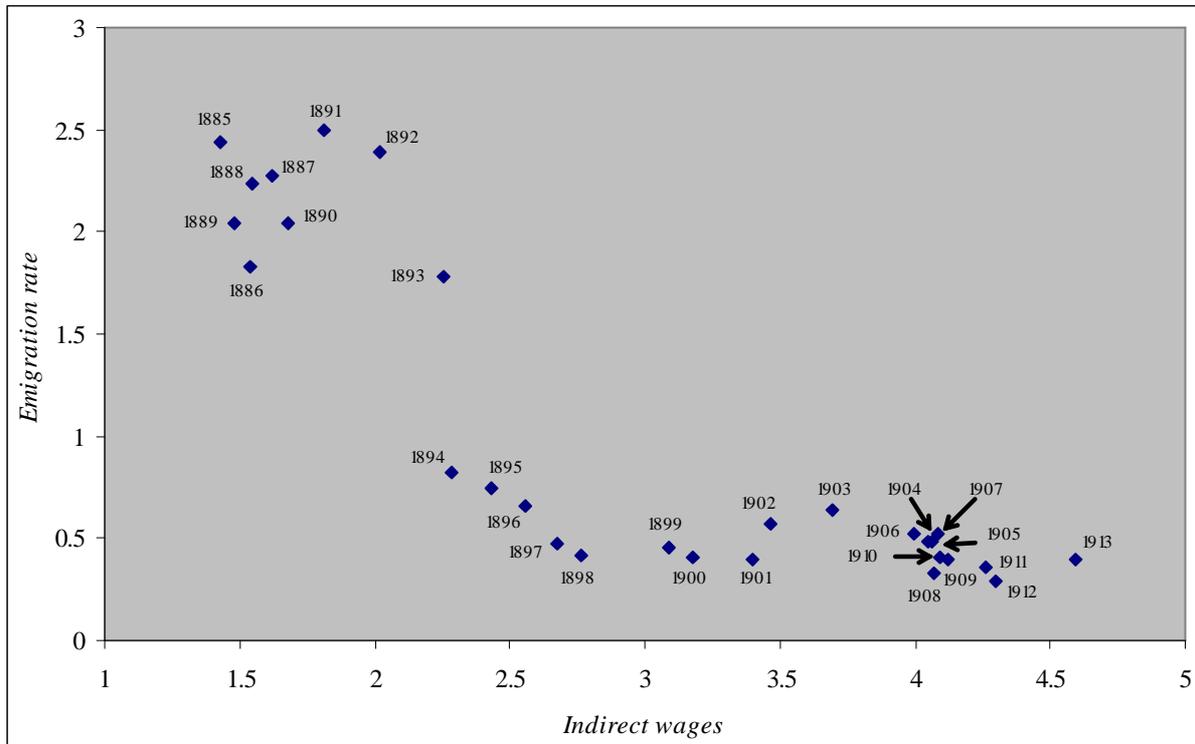
Sources: Emigration rate: Ferenczi and Willcox (1929); indirect wages: see table 14.

In order to understand the impact of the pre-World War I social legislation, it is necessary to put oneself in the position of German candidates for emigration. On the one hand, they had the possibility to move to the United States, where the economy grew faster and (direct) wages were higher than in Germany, but where they did not have the guarantee to find a job, where the competition with other migrants was tougher and tougher, and where they could lose everything in the event of a disease or an accident. On the other hand, they could stay at home, where (direct) wages were lower than in America, but where the growing industry was absorbing more and more manpower, where they would receive social benefits when they needed them, and where, eventually they did not have to cope with the psychological costs of moving in a foreign country. It is therefore likely that risk-adverse individuals increased the value of indirect wages beyond their real value, which allows to understand why the adoption of the German social legislation had such an impact on emigration patterns.

Econometric evidence

The basic model defined in equation 9 (see section III) is estimated on the German time series from 1872 to 1913. The results are reported in table 20. The dependant variable is the gross emigration rate, i.e. the annual number of emigrants per thousand resident population (author's calculation based on Ferenczi and Willcox, 1929). The direct wage gap is the logarithm of the ratio of American to German real wages. American real wages are taken from Williamson (1995), while German real wages are derived from Desai (1968). For Germany, real wages are net direct wages, i.e. the difference between direct wages and the contributions that workers had to pay in order to be insured. The method and results of calculations are presented in tables 15 and 16. German indirect wages have been calculated at the beginning of this section. The results are presented in table 17. As explained previously, we consider that, due to the lack of social insurance mechanisms in the United States during the studied period, American indirect wages were equal to zero. Therefore, the indirect wage gap between Germany and the U.S. is only represented by German indirect wages. The total wage gap, as for it, corresponds to the ratio of the direct wage gap in the U.S. to the sum of direct and indirect wages in Germany (see table 18). Finally, on account of the deficiency of unemployment statistics before 1890 in the U.S. and in Germany, we assume that employment opportunities in both countries are given by the evolution of the economic activity, which is measured by the deviations of the logarithm of real GDP from a linear trend (author's calculation based on Romer, 1989, for the U.S., and Maddison, 2003, for Germany).

Equations 1 and 2 are estimated for the period 1872-1913. The first equation only takes into account the direct wage gap. All the coefficients have the expected signs, but only the lagged dependant variable and the U.S. activity have a significant coefficient (at the 1% level). In accordance with conclusions of section I, direct wage gap does not constitute a valid explanation for the decline in the emigration rate. The second equation presents best results than the first one. Not only all the coefficients have the expected signs, but most of them are also significant, at least at the 10% level. Moreover, on the contrary of the sole direct wage gap, the total wage ratio is significant at the 5% level, which confirms that part of the explanation for the drop in German emigration lies on the implementation of social insurance in the 1880s. Indeed, the increase in German indirect wages entailed a reduction of the total wage gap between the U.S. and Germany, which, on turn, came with less emigration.

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Table 20

Regression results

Dependant variable: German emigration rate	(1) 1872-1913	(2) 1872-1913	(3) 1886-1913	(4) 1886-1913
Intercept	-1.86	-2.80**	-0.43	1.10
	(-1.29)	*(-2.41)*	*(-0.37)*	*(1.10)*
Log direct wage ratio (t-1)	3.30		0.81	1.09
	(1.52)		*(0.47)*	*(0.80)*
German indirect wages (t-1)				-1.19***
				(-4.22)
Log total wage ratio (t-1)		5.11**		
		(2.71)		
German economic activity (t-1)	-9.19	-11.69*	-8.55	-14.59**
	(-1.27)	*(-1.80)*	*(-0.90)*	*(-2.06)*
U.S. economic activity (t-1)	16.54***	14.91***	5.85	6.91**
	(2.91)	*(2.85)*	*(1.32)*	*(2.05)*
German emigration rate (t-1)	0.89***	0.87***	1.01***	0.73***
	(5.71)	*(6.08)*	*(5.35)*	*(4.55)*
German emigration rate (t-2)	-0.23	-0.31**	-0.20	-0.38***
	(-1.50)	*(-2.13)*	*(-1.22)*	*(-2.85)*
Number of observations	42	42	28	28
Mean dependant variable	1.42	1.42	0.96	0.96
R^2	0.85	0.87	0.91	0.95
Adjusted R^2	0.83	0.85	0.89	0.94
Standard error of regression	0.52	0.49	0.26	0.20
Residual sum of squares	9.72	8.59	1.44	0.81
Durbin-Watson	1.30	1.37	1.66	1.93
F-statistic	41.61	48.03	45.60	67.40

Note: The t-statistics are reported in parentheses. One asterisk means that the coefficient is significant at the 10% level, two asterisks that the coefficient is significant at the 5% level, and three that the coefficient is significant at the 1% level.

Equations 3 and 4 correspond to the period 1886-1913, which allows us to distinguish between direct and indirect wages. As in equation 1, equation 3 merely includes direct wages. Only the one-year lagged dependant variable is significant at the 1% level. Even though they present the expected sign, the other coefficients are not significant. This equation clearly does not serve for interpreting the course of German emigration before World War I. On the contrary, equation 4 reveals much more on the reasons why German workers stopped moving abroad. First of all, the coefficient of German indirect wages is significant at the 1% level and presents the expected sign, which means that a rise in indirect wages brings about a fall in German outflows. The coefficient of the direct wage gap shows that an increase in the wage

gap implies more movements from Germany to America. Yet, the coefficient is not significant. The coefficients of German and American activities, as for them, are significant at the 10% level and have the expected sign, which seems to mean that, beyond social insurance, business cycles still counted for a part in migration fluctuations: a surge in German GDP and/or a decrease in U.S. GDP comes with less emigration, while a drop of the German economic activity and/or an increase in the U.S. activity entails a raise in outflows.

Figure 12
Actual *versus* fitted emigration rates: 1886-1913
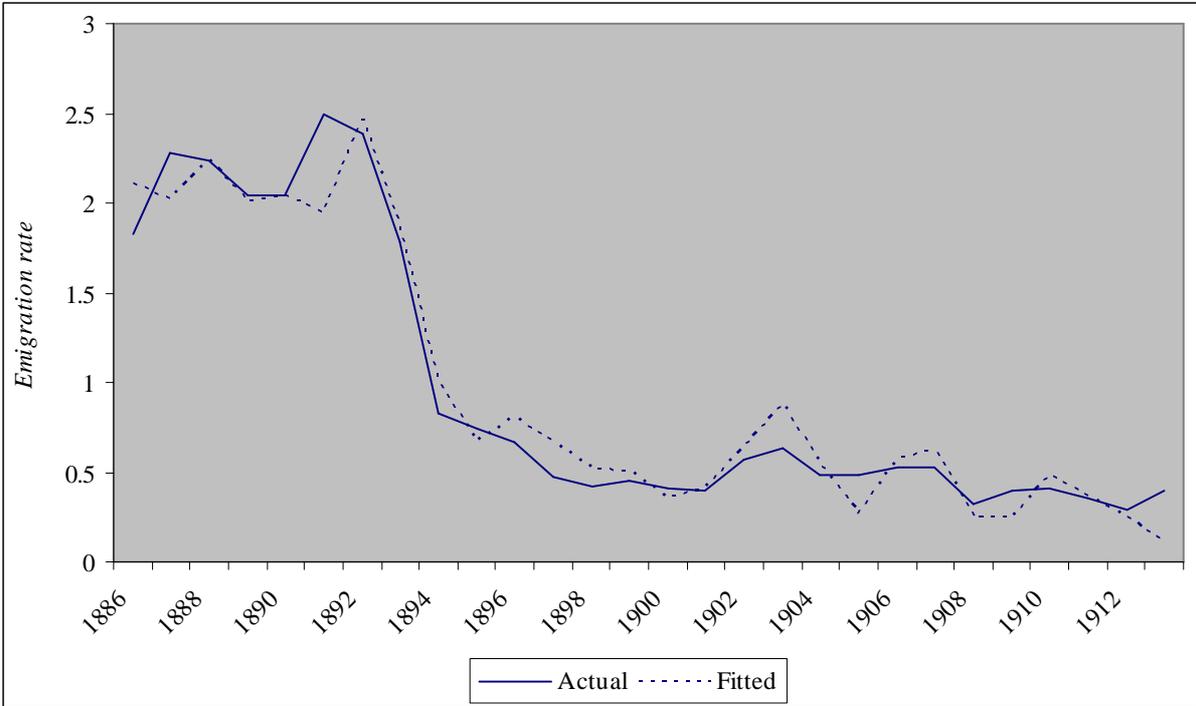
Sources: Actual emigration rate: author's calculations based on Ferenczi and Willcox (1929); fitted emigration rate: estimated from table 14, equation 4.

In total, equation 4 gives the best estimation for the German emigration rate (see figure 12). Not only the estimated coefficients are more significant, but also the R^2 and adjusted R^2 are higher than for other equations, while the standard error of regression and the residual sum of squares are lower. In other words, the regression results corroborate the hypothesis according to which the decline of the German emigration rate was partly due to the

implementation of the Bismarck's social legislation. Thus, it can be deduced from equation 4 that an increase in indirect wages by 10% generated a decrease in the emigration rate by 6%.

German emigration without Bismarck: a counterfactual analysis

As seen previously, equation 4 (table 20) provides the best results for the German emigration rate during the period 1886-1913. The estimation equation therefore is:

$$EMIG_t = 1.10 + 1.09 \cdot DIRECT_{t-1} - 1.19 \cdot INDIRECT_{t-1} - 14.59 \cdot GDP.GER_{t-1} + 6.91 \cdot GDP.US_{t-1}$$
$$+ 0.73 \cdot EMIG_{t-1} - 0.38 \cdot EMIG_{t-2}$$

where *EMIG* is the German emigration rate, *DIRECT* represents the logarithm of the ratio of American direct wages to German direct wages, *INDIRECT* corresponds to the logarithm of German indirect wages, and finally *GDP.GER* and *GDP.US* are, respectively, the deviations of the logarithm of German and American real GDP from a linear trend.

Now, we try to figure out what would have possibly happened if German legislators had not adopted the three 1880s social laws. In this perspective, let's assume that German indirect wages are nil and that other conditions do not vary. Then, the estimation equation for German emigration becomes:

$$EMIG_t = 1.10 + 1.09 \cdot DIRECT_{t-1} - 14.59 \cdot GDP.GER_{t-1} + 6.91 \cdot GDP.US_{t-1}$$
$$+ 0.73 \cdot EMIG_{t-1} - 0.38 \cdot EMIG_{t-2}$$

The results of this counterfactual estimation are presented in table 21. It clearly appears that without social insurance, German emigration rates would certainly have been higher than what they really were. As a matter of fact, between 1886 and 1913, the average counterfactual emigration rate would have been 2.16‰, i.e. 2.25 times the average actual emigration rate (0.96‰), and the difference widens by the second half of the 1890s, the counterfactual emigration rate being three to seven times higher than the actual one. This confirms the analysis according to which the implementation of the Bismarck's social legislation brought about an increase in German indirect wages that deterred risk-adverse individuals from moving abroad.

Table 21

Actual *versus* counterfactual emigration rates: 1886-1913

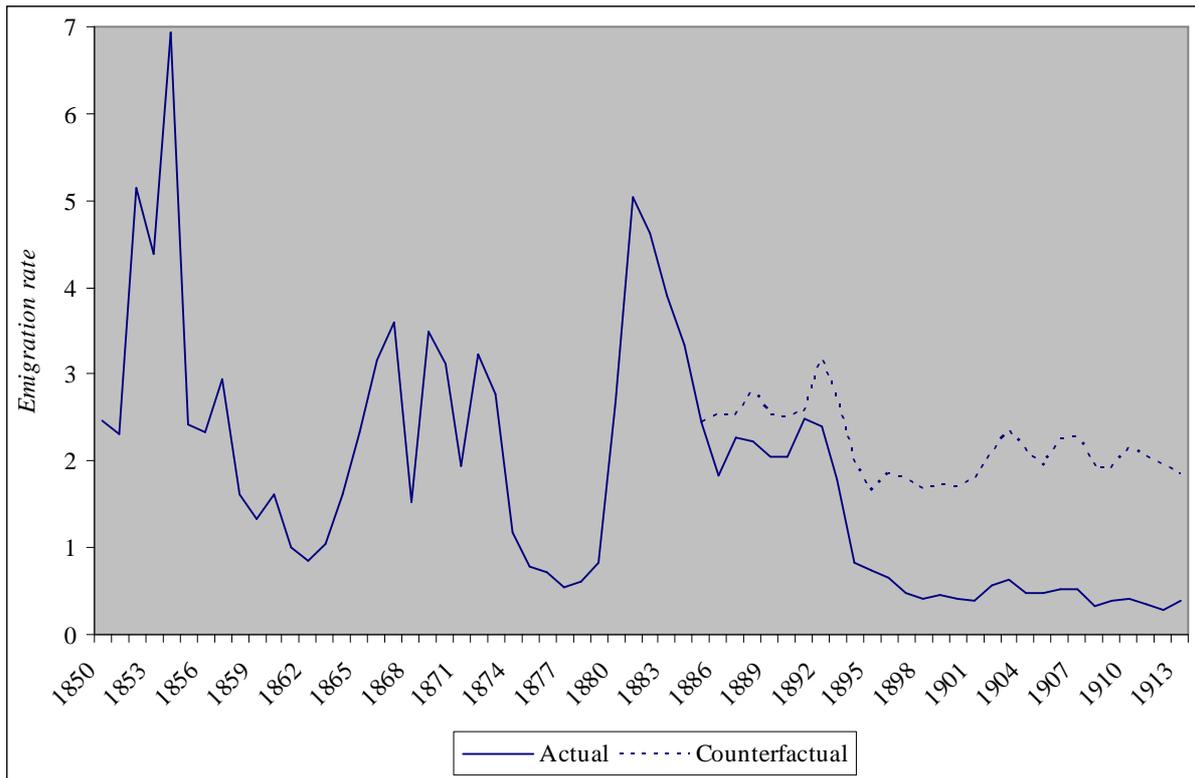| Year	Actual	Counterfactual	Counterfactual/Actual
1886	1.83	2.53	1.38
1887	2.28	2.54	1.11
1888	2.23	2.81	1.26
1889	2.04	2.53	1.24
1890	2.04	2.50	1.23
1891	2.50	2.57	1.03
1892	2.39	3.18	1.33
1893	1.79	2.70	1.51
1894	0.82	1.97	2.39
1895	0.74	1.65	2.22
1896	0.66	1.86	2.82
1897	0.47	1.79	3.77
1898	0.42	1.68	4.00
1899	0.45	1.72	3.79
1900	0.41	1.70	4.15
1901	0.40	1.78	4.45
1902	0.57	2.09	3.65
1903	0.64	2.36	3.71
1904	0.48	2.11	4.35
1905	0.48	1.94	4.04
1906	0.52	2.24	4.29
1907	0.53	2.27	4.33
1908	0.33	1.93	5.92
1909	0.40	1.92	4.78
1910	0.41	2.17	5.35
1911	0.36	2.05	5.76
1912	0.29	1.97	6.86
1913	0.40	1.85	4.65
Mean	0.96	2.16	3.41

Source: see explanation above.

Figure 13 represents both the actual and counterfactual emigration rates in a long-term perspective (1850-1913). As explained previously, the lack of social insurance would have entailed a significant rise in the German emigration rate. It is nevertheless important to notice that the emigration rate would have stayed below the high levels of emigration of the 1850s, mid-1860s, or early 1880s, and also below the average levels of other European countries at the same time (see table 1). This result is the confirmation that not only social insurance, but also other forces, such as the growth of the German industry or the competition in American labor markets with workers from southern and eastern Europe, were involved in the process. Yet, the impact of these forces would have likely been lower without the existence of the social legislation implemented in the 1880s and 1890s, since the improvement of working

conditions and the increase of indirect wages pressed German workers for waiting before to take the decision to move.

Figure 13

Actual *versus* counterfactual emigration rates: 1850-1913

Sources: Actual emigration rate: author's calculations based on Ferenczi and Willcox (1929); counterfactual emigration rate: table 21.

Conclusion

The examination of the German case before World War I allows to conclude that there is a strong link between Welfare State and labor mobility. Indeed, the introduction by the chancellor Bismarck of three basic social laws during the 1880s brought about a significant decrease in the German emigration rate. The main explanation is that candidates for migration consider not only the gap between direct wages in sending and receiving countries, but also the differential in what we have called indirect wages, that is, social benefits. As a matter of fact, the existence of such benefits is a form of social remuneration that partly offsets low levels of wage rates in sending countries. In that perspective, econometric tests show that the increase in German indirect wages after 1885 was accompanied by a strong reduction of labor outflows. Counterfactual calculations, as for them, estimate that the German emigration rate would have been more than twice higher without the existence of social insurance mechanisms. And it is probably an underestimation, since the improvements in working conditions carried out by the revision of the Industry Code in 1891 are mostly qualitative and then difficult to take into account in the measures. They notably are at the origin of the acceleration in the fall of German emigration in the 1890s.

It is patently obvious that these results should be extended to other periods and/or other geographical areas. Thus, it seems reasonable to think that the growing social intervention in European countries during the interwar years contributed to fueling the decrease in the emigration rates of these countries. Similarly, the current low degree of labor mobility in Western Europe in comparison with the United States is probably due to the higher share of social expenditures in the European GDP than in the American one. In that sense, the lack of job security coupled with low levels of unemployment benefits in the United States likely accounts for a large part of migration flows between American States. On the contrary, the generosity of social security systems in several European nations explains that labor mobility remains low, despite the free movement of persons within the European Union. In the same way, high emigration rates in developing countries are not only the consequence of low incomes, but also the result of the absence of social policies in most of these countries.

Eventually, the confirmation of an inverse relationship between social expenditures and emigration rate opens new perspectives for investigations in other economic fields. For instance, the analysis on the optimality of currency areas should take into account the diversity of social policies inside currency unions. Indeed, monetary integration between

developed Welfare States (for example, the European Economic and Monetary Union) implies that the degree of labor mobility is lower than between more liberal economies (the American States), which could be considered as an obstacle to the good functioning of the currency area. Yet, the existence of social insurance mechanisms contributes to easing the burden of the loss of the exchange rate instrument and to improving the acceptability of monetary integration from the population standpoint.

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