

Evaluating the Swiss Transitory Labour Contribution
to Germany in the Second War

Eric Golson

Department of Economic History
London School of Economics
Houghton Street
London, WC2A 2AE

Tel: +44 (0) 20 7955 7860
Fax: +44 (0) 20 7955 7730

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Dr. Eric Golson[†]

ABSTRACT

Histories of southern German firms during the Second World War suggest that Switzerland provided many highly-skilled labourers for Germany's war effort, but no study has to date quantified these contributions. This paper examines the labour exchanges between the two countries, focusing on individuals working within a free movement and trade area in the border region of Switzerland and Germany. A maximum of 1,800 Swiss workers is ascertained to have worked in the German part of this area, representing 7.5% of the total labour force, 12% of the highly-skilled labour force and over 20% of the metal workers in the ten-kilometre German zone. Swiss contributions are somewhat offset by Germans working in the Swiss zone. Most importantly for Swiss neutrality, this paper suggests that, despite initially supportive increased labour transfers at the start of the war, the Swiss government sought from 1941 to prevent workers from transferring to Germany.

Keywords: Switzerland, Germany, Labour Transfers, Exchange Controls, World War II

JEL Classifications: N14; N44; N74

[†] Teaching Fellow, London School of Economics; Research Fellow, University of Oxford. The author gratefully acknowledges the support of the Economic History Society through an EHS Anniversary Fellowship (2011-2012). Telephone: +44 79 6109 4393. E-mail: e.b.golson@lse.ac.uk

Introduction

Before, during and after the Second World War, Switzerland and Germany maintained a free movement and trade zone known as the *Klein Grenzgebiet* [small border area], which allowed the free movement of goods, materials and labour within a twenty-km area straddling the Swiss-German border. This is the only example of labour exchange where individuals could live in a neutral country and voluntarily work in a belligerent throughout the war. Before the war, other countries, including the Netherlands, Belgium and Luxembourg, operated similar arrangements. These agreements terminated with the start of hostilities.¹

During the war, this zone operated under an agreement dated 9 March 1939, the Schweizerisch-deutsches Abkommen über den kleinen Grenzverkehr [the Swiss German Agreement on Small Border Traffic]. This agreement was ratified on 29 August 1939, a day after the Swiss army mobilized in preparation for war.² Individuals living within a 10-km area on either side of the border could move freely within the overall zone for any reason, including labour; they could also transfer money and goods up to certain limits freely across the border.³ Figure 1 shows the *Klein Grenzgebiet* area with the internal Swiss cantonal borders. This new agreement dramatically improved the potential for employment exchanges in the zone by increasing allowable cash remittances from 10 Reichsmarks (equivalent to 17.5 Swiss Francs) per month to 10 Reichsmarks per working day.⁴ This increased the workers' ability to remit wages, but limited transfers to those who lived in the *Klein Grenzgebiet* zone. Swiss living outside the zone could no longer remit wages without government permission and are therefore beyond this study's scope.⁵

The *Klein Grenzgebiet* had many natural advantages during the Second World War for Germany's strained labour and capital. Swiss-owned manufacturing plants had long been established in the German part of the zone. These facilities used fewer German resources than similar German facilities elsewhere.⁶ Germany did not have to house, clothe or feed this workforce, based in Switzerland. The Swiss Federal Railways transported the workers on tracks powered by electricity from Swiss hydro-electric plants along the Rhein to such German cities as Waldshut, Singen and Konstanz.⁷ Switzerland also provided some raw materials for businesses in

¹ Edward Homze, *Foreign Labour in Nazi Germany* (Princeton, 1967); National Archives and Records Administration, College Park, Maryland (hereafter NARA) RG242/T-77/243/901075-901076.

² Schweizerische Bundesarchiv, Bern, Switzerland (BAr) E1070/1000-34/123, agreement dated 9 March 1939; BAr E1070/1000-34/123, parliamentary message dated 29 August 1939.

³ BAr E2001D/1000-1152/38 memo dated 17 February 1940, pp.6-7.

⁴ BAr E1070/1000-34/123, agreement; BAr E7160-01/1968-223/249, undated memo marked "Bericht über die Grenzverkehrsverhandlungen mit Deutschland vom 10. bis 13. August"

⁵ Archives of the Ministerio de Asunto Exteriores y de Cooperación [Spanish Foreign Ministry] (AMAEC) R2225/1, pamphlet "*Der Einsatz ausländischer Arbeitskräfte in Deutschland, Berlin 1942*" [The Employment of Foreign Workers in Germany, Berlin 1942], pp.98-102.

⁶ See chapter entitled "*Die Steigerung der Produktion in Deutschland und Italien*" [The Increase of Production in Germany and Italy] in *Geschichte der Aluminium-Industrie-Aktien-Gesellschaft Neuhausen 1888-1938: Zweiter Band* [History of the Aluminium Company, 1888-1938: Second Volume, 1921-1938] (Zürich, 1943), pp.139-152; Hans Ulrich Wipf, *Georg Fischer AG, 1930-1945: Ein Schweizer Industrieunternehmen im Spannungsfeld Europas* [Georg Fischer, 1930-1945: A Swiss Industrial Company in the European Conflict Zone] (Zürich, 2001), pp.181-434.

⁷ Horaire Suisse 1943 [Swiss Rail Timetable] (Zürich, 1942) ; Jean-Daniel Kleisl, *Electricité Suisse et Troisième Reich* [Electricity in the Third Reich] (Zürich, 2001).

this area.⁸ These advantages persuaded Germany to seek increased production there and to recruit as many Swiss as possible.

Existing figures for the number of Swiss workers in the *Klein Grenzverkehr* zone are at best vague. Memos from late 1941 to mid-1943 indicate that Germany tried to recruit 35,000 transitory highly-skilled Swiss metal and building workers into this area; this correspondence implies a large number working there already.⁹ However, separate German border crossing statistics for January 1940 indicate, on average, only 2,552 daily border crossings, of which only 1,285 emerge as Swiss.¹⁰ The Swiss Federal Office of Statistics figures show only 485 workers commuting to Germany in November 1939;¹¹ however, this office names no source for these statistics or methods for compiling them.

Studies of the *Klein Grenzgebiet* suggest the importance of these highly-skilled labourers and managers; however, none provide figures for the number of Swiss workers involved, their earnings or estimates of their economic contribution to the German war effort.

Historians Christian Ruch, Myriam Rais-Liechti and Roland Peter, members of the Commission of Independent Experts (CIE) established to study Swiss neutrality in the Second World War, suggest relatively close links between Swiss businesses in the German part of the *Klein Grenzgebiet* and their parent companies in Switzerland.¹² The CIE studies provide an April 1943 figure of 26,876 non-German labourers in these Swiss firms in Southern Germany, in an employment total of 158,690; this includes workers both inside and outside the *Klein Grenzverkehr*.¹³ They worked for companies including the Swiss aluminium conglomerate, *Aluminium Industrie AG* (AIAG), the chemical company Lonza and food companies Maggi and Nestlé.¹⁴ The first two were especially important to the German war effort, producing about 7% of all German carbide and 15% of all German aluminium in this area.¹⁵ The Swiss parents of these subsidiary companies demonstrably maintained significant control over them, providing, *inter alia*, managerial expertise, machine tools, raw materials, capital for expansion and other necessities for their daily operation.¹⁶ In a discussion of factory workers from Eastern Europe, the authors imply a net Swiss labour contribution to the *Klein Grenzverkehr*, but they do not provide a full account of it.¹⁷

This study finds at most 1,800 Swiss transitory labourers, a small fraction of the 26,876 foreign workers indicated by the CIE study who worked in the *Klein Grenzgebiet* during the war, a disproportionate number were skilled. They represent 7.5% of the total labour force in

⁸ Roland Peter, Myriam Rais-Liechti, and Christian Ruch, *Geschäfte und Zwangsarbeit* [Business and Forced Labour] (Zürich, 2001).

⁹ NARA RG242/T-77/243/986448-986453; NARA RG242/T-77/243/986769; NARA RG242/T-77/243/986482; NARA RG242/T-77/243/986480-81; NARA RG242/T-77/243/986440-986458.

¹⁰ NARA RG242/T-77/243/901075-901076.

¹¹ BAr E3320B/1000-773/22, *Deutsch-schweizerischer Grenzverkehr seit Juli 1936* [German-Swiss Border Area since July 1936] and *Österreich-schweizerischer Grenzverkehr seit März 1938* [Austrian-Swiss Border Area since March 1938] in "*Deutsch-schweizerischer und Österreichisch-schweizerischer Grenzverkehr, November 1939* [German-Swiss and Austrian-Swiss Border Area, November 1939]."

¹² Cornelia Rauh, *Schweizer Aluminium für Hitlers Krieg?* [Swiss Aluminium for Hitler's War?] (Munich, 2009).

¹³ Peter et al, *Geschäfte und Zwangsarbeit*, p. 221.

¹⁴ *Ibid*, pp.123-200.

¹⁵ Kleisl, *op. cit.*, p.63 and p.101.

¹⁶ Peter et al, *Geschäfte und Zwangsarbeit*, pp.79-211.

¹⁷ *Ibid*, pp.216-233.

the German *Klein Grenzgebiet*, but less than 0.2% of the total labour force in the German *Land* of Baden.¹⁸ The counter-traffic of Germans working in Switzerland totalled no more than 1,400 transitory workers, who were more likely than their Swiss counterparts to be both unskilled and female. As a result of the skill and gender disparity, the Swiss provided Germany with an economic contribution three times the counter flow.

Finally, the Swiss sought to limit worker transfers, in particular after 1941. Swiss policies are very contradictory in this period. Although the government went to the trouble of ratifying a new treaty covering the *Klein Grenzgebiet* at the Federal level three days before the War started, local Swiss governments acted almost immediately to limit worker transfers;¹⁹ they progressively increased the costs of the permits needed to cross the border and limited customs transfers to those specifically allowed in the Treaty, preventing excess funds from leaving Germany.²⁰ These restrictions limited the advantages of working in the *Klein Grenzgebiet*. Workers there relinquished their jobs faster than in the German workforce, after 1943 in particular.²¹ These changes to Swiss local government policies demonstrate that the Swiss did not ultimately favour providing Swiss labour to Germany. Thus, the 1939 Swiss-German Treaty actually served to strengthen Switzerland's independent position by seeking to limit labour contributions, while appearing to benefit the Germans.

Methodology

In estimating the workers, only the voluntary "guest" labourers who were:

1. Not permanent residents in their country of employment
2. Citizens of their home country
3. Able to remit their earnings to their home country

are counted. The current system of identifying foreign workers on the basis of citizenship is irrelevant if they cannot leave the belligerent country with their earnings. For Germany and Switzerland, these exchanges were limited to those living and working within their respective areas of the *Klein Grenzgebiet*.²² Only permanent resident aliens who could return with their earnings are counted. **(See Table 1)**

Undeniably, these limitations reduce the scope of this study. German statistics indicate approximately 16,000-18,000 Swiss citizens working in Germany during the Second World

¹⁸ *Ibid*, p.336.

¹⁹ Archiv Kanton Basel-Stadt (StABS), PD-REG/8c/(1)/2-1:3, Protocol dated 16 October 1939; Archiv Kanton Zürich (StAZH) Z6.6098, letter dated 22 January 1940; Archiv Kanton Aargau (StAAG) BA.09.0692, letter dated 9 September 1939; StAZH Z6.6098, protocol dated 26 September 1939.

²⁰ StAZH BEZ/AND/134/2-3.

²¹ Appendix A; Roland Peter, *Rüstungspolitik in Baden. Kriegswirtschaft und Arbeitseinsatz in einer Grenzregion im Zweiten Weltkrieg* [War Industry Politics in Baden: War Business and Labour in the Border Region during the Second World War] (Munich, 1995), p.336.

²² See Figures 1 and 2; BA R E1070/1000-34/123, agreement dated 9 March 1939.

War;²³ but, as this paper shows, fewer than 1,800 of these Swiss citizens were residents of Switzerland. Only the Swiss residents working in Germany were subject to Swiss border controls, Swiss laws and the limitations on transferring remittances. The remaining 14,000-16,000 Swiss citizens in Germany were permanent residents there and hence largely beyond Swiss jurisdiction. They could not remit funds from Germany unless parallel contra-funds were available.²⁴

For greatest accuracy, whenever possible this study uses figures from the lowest government level; this means using largely Swiss sources. In Germany, organizational responsibility for the *Klein Grenzgebiet* was highly centralized. Searches of both Federal and local German records have not yielded records which survived the war;²⁵ in Switzerland, monitoring, shared between the Swiss Federal Government and the individual cantons bordering Germany, was highly decentralized. Decentralization created duplicate entities with overlapping responsibilities, many maintaining copies of cantonal records. Estimates are derived from these materials.

As seen in Table 1, only a few records and statistics on Swiss transitory workers in Germany have survived. Canton Zürich maintained complete indices of the 3,612 *Grenzkarte* [border passes] issued from 1 January 1938 to 31 December 1946, along with relevant personal data. These records have been redacted and sorted to reveal 2,085 permits issued to unique individuals.²⁶ The *Arbeitsamt* [Labour Bureau] in Canton Aargau counted migrant workers by skill-type and gender bi-yearly.²⁷ The police in Canton Basel-Stadt maintained records on *Grenzkarte* holders during the early war period which included name, date of birth and occupation; genders can be reasonably assumed from the given names.²⁸ Statistics for Graubünden provide a very small number of transitory workers of unknown skill and gender. A summary of these statistics is reported later.

As unit level figures for Cantons Schaffhausen, Thurgau, St. Gallen and are not available, they must be obtained through a proportional comparison of *Klein Grenzgebiet* trade with Cantons Basel Stadt, Zürich and Aargau according to Swiss Federal statistics;²⁹ in estimating, it must be assumed that workers in the former group remitted the same amount in cash and goods as in the latter. Total economic activity of Canton Schaffhausen is 20% of the customs district including Cantons Basel Stadt, Aargau and Zürich in November 1939 and 150% for Canton Thurgau. The homogeneity of the regions makes this reasonable.³⁰ The information thus derived provides the total number of Swiss workers in Germany every quarter from November

²³ Mark Spoerer, *Zwangsarbeit unter dem Hakenkreuz: Ausländische Zivilarbeiter, Kriegsgefangene und Häftlinge im Deutschen Reich und im besetzten Europa 1939-1945* [Labour under the Swastika: Foreign Civilian Labour, POWs and Forced Labour in the German Reich and the Rest of Europe, 1939-1945] (Stuttgart, 2001) p.87 and p.222. NARA RG242/T-77/243/986879-986880; NARA/RG242/T-77/243/985921-985922; Imperial War Museum Archive Duxford (IWM-D) FD847/46, graphic entitled "Der Arbeitseinsatz ziviler Ausländer nach der Staatsangehörigkeit [Civilian Foreign Worker Statistics by Citizenship]" in *S-Buch, Arbeitseinsatz* [S-Book, Worker Statistics].

²⁴ BAr E1070/1000-34/123, letter dated 8 February 1940.

²⁵ BA-MA; StdtAK; and StdtWST.

²⁶ StAZH BEZ/AND/134/2-3.

²⁷ StAAG BA.09.0596, reports; StAAG BA.09.0692, reports; StAAG BA.09.0693, reports.

²⁸ StABS PD-REG/8c(1)/2-1:3, lists of border permits attached to correspondence dated between 28 February and 11 April 1940.

²⁹ BAr E2001D/1000-1552/38, letter dated 22 May 1940; BAr E6351F/1000-1044, letter dated 31 January 1939; BAr E6351F/1000-1044/491, letter dated 24 February 1939.

³⁰ SJdS, 1945.

1939 to December 1945; for comparative purposes, these figures are extended backwards to June 1936 using available wage remittance statistics for the entire *Klein Grenzgebiet*.³¹

The archival figures for German residents working in Switzerland are sparser than the converse totals. In Canton Basel Stadt, the police maintained registers of those who obtained permits; the Canton Aargau *Arbeitsamt* [Labour Bureau] also maintained bi-annual counts of German workers in Switzerland.³² The Swiss Federal Customs Office had figures for the number of German residents commuting to Cantons Zürich, Schaffhausen, Thurgau, St. Gallen and Graubünden for work in 1943.³³ Applying the changes seen in Canton Aargau to the figures for the other cantons gives a complete count for German workers in Switzerland every quarter from November 1939 to June 1945.³⁴

Using the permit and border crossing figures for both groups of labourers allows additional statistics for each worker group to be calculated. Estimates are made of gender, skill levels and the earnings of each group each quarter throughout the war.

Statistics generated by the *Rüstungsinspektion Oberrhein für Baden* [the Production Inspectorate for Baden, in the Upper Rhein Area] are used to generate figures for the actual number of German workers and their occupations in the *Klein Grenzgebiet*. As no precise figures for the ten-kilometre zone are available, local districts [called *kreis*] in which the ten-kilometre zone is situated (even partially) are used. As Table 2 shows, these districts include those with regional capitals in Lörrach, Säckingen, Waldshut, Donaueschingen and Konstanz. With available information, this yields 24,950 workers in the German part of the ten-kilometre zone.³⁵ The estimated number of highly-skilled and metal workers in Baden is based on 1938 skill allocation figures, as shown graphically by the *Baden Statistischen Landesamt* [Baden State Statistics Office].³⁶ Estimates for the number of workers in highly-skilled and metal-working jobs are included in Table 2. The 1938 percentages of skilled labour are multiplied by the 1943 worker figures, failing other statistics of the number of skilled workers. Although no compensation has been made, using 1938 skill figures introduces some downward bias, since the number of highly-skilled and metal workers should have increased during the war.

All the sources, both Swiss and German, admit substantial shortcomings. Most notably, there are potential bias effects, for available government statistics for most cantons provide only sporadic data points throughout the period. The long-term projections for Swiss commuting to Germany rely solely upon statistics from Cantons Zürich and Aargau; and on Canton Aargau alone for Germans commuting to Switzerland. Using the figures from so few cantons to project overall trends lets in bias effects for specific cantons. Although no evidence suggests this, it could very well be Aargau that experienced inordinate increases or reductions in its numbers of wartime workers. Given the information available, this potential error cannot be eliminated.

³¹ BAr E3220B/1000-773/22, report dated January 1940, pp.15-16; SJdS, p.10.

³² StABS PD-REG/8c(1)/2-1:3, lists of border permits attached to correspondence dated between 28 February and 11 April 1940; StAAG BA.09.0596, reports; StAAG BA.09.0692, reports; StAAG BA.09.0693, reports.

³³ BAr E6351F/1000-1046/12, letter dated 30 October 1943; BAr E6351F/1000-1046/12, letter dated 30 October 1943; BAr E6351F/1000-1046/12, letter dated 10 November 1943.

³⁴ BAr E3220B/1000-773/22, report dated January 1940, pp.15-16; SJdS, p.10.

³⁵ BA-MA RW20-5/51- 57.

³⁶ Peter, *Rüstungspolitik*, p.92.

Swiss Workers in Germany

This section provides overall statistics for the Swiss residents working in the German *Klein Grenzgebiet*. It determines that there was a maximum of 1,800 Swiss workers in Germany, mostly highly-skilled males, transiting between Switzerland and Germany from June 1936 through mid-1946, roughly 7.5% of the labour force in the *Klein Grenzgebiet* area.³⁷ The figures declined steeply during the war.

Table 3 shows quarterly statistics for each canton, as well as the total number of Swiss workers commuting to the Baden *Klein Grenzgebiet*. Cantonal figures reported in bold are taken from archival sources; those in normal typeface are generated from estimates, in accordance with previously-mentioned practice. As Table 7.3 and Figure 7.2 indicate, the population of Swiss workers commuting to work in the German *Klein Grenzgebiet* declined from approximately 1,800 in December 1939 to about 560 by June 1945.³⁸

Breaking this decline into periods, from December 1939 to December 1941, the figures fell slowly, by about 15% of the workforce; however, as German efforts to mobilize labour and foreign labour recruitment increased in 1942, the number of Swiss workers in the *Klein Grenzgebiet* decreased more rapidly.³⁹ From March to December 1942, just over one-third of this group stopped working in Germany. A slight increase of approximately 80 workers or about 10% of the workforce followed from December 1942 to June 1943; however, between June 1943 and June 1945, the number of these Swiss workers halved. The reasons for the rapid decline in June 1945 to the low point of 563 transitory workers - about 2.5% of the labour force in the ten-kilometre area - are discussed in the last section.

Skills and gender figures vary between cantons, depending on the economic environment in the area immediately past the border. Among the known figures, the workers leaving Canton Aargau to work in Rheinfelden and Waldshut were mostly highly-skilled male metal-workers, with 88% estimated as skilled and 86% male in December 1939;⁴⁰ however, those leaving Zürich were largely unskilled (32%) and agricultural workers (42%); they typically owned farms immediately across the border. 90% of the workers from Zürich were male.

To provide a comprehensive skill and gender profile of all Swiss residents travelling to Germany beyond Cantons Aargau and Zürich requires certain assumptions about individual cantons for which no or limited data are available. Too little stand-alone information remains on the skill sets and gender distribution of workers in Cantons Basel-Stadt, Thurgau, Schaffhausen, St. Gallen and Graubünden for a complete wartime profile; however, the figures for these cantons can be estimated using known quantitative and qualitative data. Skills and gender figures are available for Canton Basel-Stadt for the two months ending April 1940. As the skills and gender concentrations in Cantons Aargau and Zürich do not vary widely, it is reasonable to assume that the skill and gender figures from Basel for workers in Canton Basel Stadt last throughout the war. High per capita monthly earnings figures in the *Eidgenössische Statistische*

³⁷ Peter, *Rüstungspolitik*, p.92; BA-MA R20-5/51.

³⁸ See sources for Appendix A.

³⁹ Peter, *Rüstungspolitik*, p.336.

⁴⁰ StAAG BA.09.0596, reports; StAAG BA.09.0692, reports; StAAG BA.09.0693, reports.

Amt reports on the Austrian-Swiss *Klein Grenzverkehr* [small border traffic] indicate that workers from St. Gallen and Graubünden consisted entirely of highly-skilled men.⁴¹

Gender and skills data for Cantons Schaffhausen and Thurgau must be estimates. With the lack of quantitative information, a gender and skill profile for these cantons must be built from qualitative knowledge. From the prevalence of factories for war materiel and the German desire to recruit highly-skilled Swiss in the Schaffhausen-Singen area, it can reasonably be assumed that highly-skilled, male labourers formed the majority of those based in Canton Schaffhausen.⁴² Swiss commuting from Thurgau to Konstanz worked in highly-skilled jobs in a city with both industry and commerce. The closest comparable canton for both is Aargau, where highly-skilled workers commuted to German industrial plants across the Rhein. Thus, gender and skills distribution estimates from Canton Aargau can be used for Cantons Schaffhausen and Thurgau.⁴³ The resulting estimates establish that most of the Swiss working in the German *Klein Grenzgebiet* were skilled.

Despite the decline in the number of workers, the wartime skill profile of Swiss workers in the German *Klein Grenzgebiet* remains fairly constant. Where displacement occurred, in the early part of the war, Swiss agricultural labour in Germany was typically replaced by skilled and unskilled workers. As Figure 3 reveals, the overall percentage of skilled labourers, starting at 70% in December 1939, reached a low of 58% in June 1943 and then returned to 74% by June 1945. Similar trends were noted in unskilled labour; at 15% in December 1939, unskilled labour reached 29% in June 1943 before returning to 21% of the total employed in December 1945. Agricultural labour remained a stable proportion of the labour force varying from 14% to 16% throughout the war. Using the December 1939 worker skill profile, 70% (1,260) of the Swiss workers in Germany were skilled, 270 were unskilled and 270 worked in agriculture. In the ten-kilometre zone, this labour would have represented about 12% of the skilled labour force.⁴⁴ Further estimated statistics on the number of metal-workers from Cantons Zürich and Aargau indicate that Switzerland supplied approximately 20% of the 3,505 skilled metal-workers in this part of Germany.⁴⁵

Using similar assumptions, it is possible to produce a gender distribution of the Swiss workforce in the German *Klein Grenzgebiet*. A disproportionate number of working men travelled across the border. As seen in Figure 4, for almost the whole wartime period men made up 79% or more of the Swiss labour force commuting to Germany; the low point for male labour was December 1942, part of a decline which started for unknown reasons in December 1941. However, the number of men had increased to 86% of the workforce by March 1944 and largely remained until the war ended.⁴⁶

The gender ratio suggests the Swiss *Klein Grenzgebiet* workers resembled the workers migrating to Germany from other countries. On average, there were seventeen men for every three women in the Swiss *Klein Grenzgebiet* group.⁴⁷ Statistics for voluntary labour from all

⁴¹ BAr E3320B/1000-773/22, report dated January 1940.

⁴² NARA/RG242/T-77/243/986448-986453.

⁴³ See summary figures in Appendix B.

⁴⁴ See Table 2.

⁴⁵ *Ibid.*

⁴⁶ See Appendix A.

⁴⁷ *Ibid.*

countries suggest that 84% were men and 16% women.⁴⁸ Using the worker statistics, skill and gender profiles, moreover, the earnings of Swiss workers in Germany can be calculated.

Quarterly earnings for Swiss residents working in the German *Klein Grenzgebiet* declined in tandem with the number of workers (see Figure 5). Some assumptions must be made to estimate earnings. Wage rates in wartime Germany are based on both skill level and gender; consequently its groups must be broken into gender-skill sub-groups, such as skilled males, skilled females, unskilled males, etc. The available statistics for the distribution of workers from Canton Aargau suggest that overall the female population comprised 10% skilled, 57% unskilled and 33% agricultural.⁴⁹ The number of male workers in each skill subset results from subtracting its total of female workers from the total in this skill level. Each skill-gender variant is then multiplied by its relevant average German salary, as reported in Appendix A.⁵⁰ These Reichsmark salaries are converted at the constant wartime rate of 1.75 Swiss Francs per Reichsmark.⁵¹

Using these assumptions, gross total estimated earnings for Swiss residents in Germany from December 1939 to June 1945 is 26.9 million Swiss Francs or approximately 0.32% of Swiss 1939 NNI.⁵² Total earnings declined consistently each quarter throughout the war, largely in tandem with the overall reduction in the number of workers. Average wages fluctuated between 912 and 1,051 Swiss Francs per worker quarter, due to changes in the composition of the workforce and small fluctuations in the German pay rates.⁵³ These figures exceed the almost nil estimates from several authors and demonstrate that Switzerland's contribution to the German war effort was important in a few specific areas of skilled labour.

Although the ultimate number of these workers and their contribution to GDP was very small, their impact on German production for certain specialty items should not be discounted. As detailed in the CIE studies, Swiss labourers working in the German *Klein Grenzgebiet* factories produced critical items for Germany, including aluminium, condensers, guns, machine tools, fittings and other specialized hardware;⁵⁴ without these the German war-machine would have been considerably less effective. Of course, the number of Germans working in Switzerland correspondingly reduces the latter's contributions.

German Workers in Switzerland

This section examines how many Germans were working in Switzerland, together with their skill and gender variants and earnings. It establishes that no more than 1,400 Germans ever worked in the Swiss *Klein Grenzgebiet* during the war and their numbers declined faster

⁴⁸ NARA RG242/T-77/243/985921-985922.

⁴⁹ StAAG BA.09.0596, reports; StAAG BA.09.0692, reports; StAAG BA.09.0693, reports.

⁵⁰ *Statistisches Handbuch von Deutschland, 1928-1944*, (hereafter SHvD), pp.470-471.

⁵¹ *Statistisches Jahrbuch der Schweiz*, 1945, p.255.

⁵² Martin Meier et al, *Schweizerische Aussenwirtschaftspolitik, 1930-1948* [Swiss External Business Politics, 1930-1948] (Zürich, 2002), p.409.

⁵³ See Appendix A; SHvD, pp.470-471.

⁵⁴ Peter et al, *Geschäfte und Zwangsarbeit*, p.123-200; Kleisl, *Electricité*, p.63 and p.101. Wipf, *Georg Fischer*, pp.275-276.

than their counterparts'. These German workers were substantially less skilled than the equivalent Swiss in Germany and contained higher proportions of women. Their profile accounts for the substantially lower earnings.

War-time figures for Germans working in Switzerland derive from Swiss cantonal figures combined with a set of October 1943 reports from the Swiss *Oberzolldirektion* on German transitory workers in Switzerland. Statistics for Canton Aargau originate from the *Aargau Arbeitsamt* reports previously mentioned and cover the whole war.⁵⁵ For other cantons it has been necessary to rely on 1943 *Oberzolldirektion* reports (covering 1942), which included information on the nationalities of the German residents working in Switzerland; for Cantons Basel Stadt, Zürich, Schaffhausen, Thurgau, St. Gallen and Graubünden, worker figures are projected from the 1942 Swiss Customs figures, based on gains and losses in Canton Aargau.⁵⁶ The principal assumption here is the increases and decreases in worker totals are similar for all cantons.

The war saw a sustained decline in the number of German-resident labourers working in Switzerland. As Figure 6 and Table 4 show, the population of Germans working in the Swiss *Klein Grenzgebiet* declined from approximately 1,384 to June 1944, reaching an intermediate low of 335; then they rose from 335 to 474 and declined again from about 335 in September 1944 to 112 in June 1945. This represented a total decline of 91% over the war.⁵⁷ Exceeding by nearly two-and-a-half times the wartime reduction in the number of Swiss workers commuting to Germany, it was probably affected by German conscription demands.⁵⁸ The precise Swiss workforce within the ten-kilometre area cannot be estimated for comparative purposes; however, the total number of German labourers commuting to Switzerland in September 1939 represents approximately 0.18% of the workforce within the relevant cantons.⁵⁹

Because of a lack of available information, the skills and gender metrics of the German residents working in Switzerland must be estimated. Skill figures from Canton Aargau and other qualitative information allow skill levels for other cantons to be assessed which take into account their geographical differences. For overall estimates for Germans working in the Swiss *Klein Grenzgebiet*, including earnings, see Appendix B. Considering the cantons overall, these figures indicate approximately 35% of skilled workers, 54% of unskilled and 11% working in agriculture; the war saw little fluctuation in the skill statistics.

These statistics using available skills or gender information are based only on the Aargau *Arbeitsamt* reports. The German residents working in Canton Aargau were mostly unskilled. The weighted wartime average of skilled labour in Canton Aargau was close to 42%, with all but 1% of the remainder consisting of unskilled labour;⁶⁰ this leads to a 40% disparity given the 80% skill level of the countervailing traffic.⁶¹

⁵⁵ StAAG BA.09.0596, reports; StAAG BA.09.0692, reports; StAAG BA.09.0693, reports.

⁵⁶ BAr E6351F/1000-1046/12, letters dated 30 October 1943; BAr E6351F/1000-1046/12, letter dated 10 November 1943.

⁵⁷ See Table 4.

⁵⁸ BAr E3320B/1000-773/22, reports.

⁵⁹ As measured from September 1939 to December 1939; SJdS 1941, p.41.

⁶⁰ StAAG BA.09.0596, reports; StAAG BA.09.0692, reports; StAAG BA.09.0693, reports.

⁶¹ Appendix A.

For the other cantons, a skill-gap similar to the one in Aargau has to be assumed. The Basel region and Canton Schaffhausen were large cities which attracted more semi- and higher-skilled German workers than did other areas in Switzerland; the number of skilled workers for these cantons is calculated on the basis of the highest skilled labour rates for Swiss travelling to work in German cities (88%), reduced by the difference in skill levels between the workers commuting to and from Canton Aargau.⁶² This yields approximately equal numbers of skilled and unskilled workers in these cantons.

By contrast, the more rural geography of the *Klein Grenzgebiet* areas in the cantons of Zürich, Thurgau and St. Gallen results in a higher percentage of agricultural and unskilled workers there. For all three cantons, the German labourers working in the *Klein Grenzgebiet* zones is estimated to be 20% skilled, 40% unskilled and 40% agricultural, based on examples of labour transfers to an agricultural area, such as Swiss workers from Canton Zürich commuting to Baden; these transfers emerge as 29% skilled, 31% unskilled and 40% agricultural workers. To compensate for the skill differential between German and Swiss workers, the number of skilled workers is adjusted downward by slightly less than one-half; the remainder are assigned to unskilled labour. This results in an estimate for Germans commuting to the more rural cantons of approximately 20% skilled, 40% unskilled and 40% agricultural. Considered together, these cantonal figures yield a combined workforce of 35% skilled, 54% unskilled and 11% agricultural workers in December 1939.

Estimates for the gender distribution of the workers, lacking other qualitative or quantitative information, are based solely on the Canton Aargau example. The gender distribution of German residents working in Canton Aargau favoured women 57% to 43%, using a weighted average of the wartime quarterly figures.⁶³ Despite the slightly above-average number of skilled (and therefore male) labourers, the gender figures for Canton Aargau are used as the wartime average. Any other method of estimating the gender figures could be very complex, due to the time-dependent changes resulting from increasing levels of German military conscription. Similarly for the countervailing traffic, amongst the female workers, 35% are estimated to be skilled and 65% unskilled/agricultural. These gender-skill statistics serve to estimate earnings.

The total earnings of Germans working in the *Swiss Klein Grenzgebiet* were about one-third of their Swiss counterparts in Germany. For comparison, salaries of equivalent average German workers are used.⁶⁴ As reported in Appendix B, gross estimated earnings for German residents working in Switzerland from December 1939 to June 1945 amount to 8.1 million Swiss Francs. This represents a miniscule 0.10% of Swiss 1938 NNI.⁶⁵ As this reveals, net quarterly earnings during the war declined steadily, with the number of workers. Average earnings for the period fluctuated between 569 and 640 Swiss Francs per worker-quarter; average wages reached a peak in March 1941 and declined thereafter.⁶⁶

The Swiss contribution to the German war effort was roughly three times the German contribution to Switzerland. The difference between the expected earnings of the transitory labour groups amounts to just under 16 million Swiss Francs in favour of Switzerland. This

⁶² StAAG BA.09.0596, reports; StAAG BA.09.0692, reports; StAAG BA.09.0693, reports.

⁶³ *Ibid.*

⁶⁴ SHvD, pp.470-471.

⁶⁵ Meier et al, *op. cit.*, p.409.

⁶⁶ See Appendix B.

indicates that 0.22% of Swiss 1938 NNI went to the Germans as transitory labour.⁶⁷ While this contribution is small, no such contribution was being made to the British or Allied war efforts.

Swiss-German Labour Exchanges and Swiss Wartime Neutrality

At first glance, the quick approval of the 1939 agreement in the days before war started suggests that the Swiss sought to actively provide Germany with labour during the war. However, the statistics showing the limits on the labour supply refute this idea. So do the actions of the local Swiss governments and Federal government departments. From the outbreak of war, Swiss officials sought through various technical procedures to reduce the number of Swiss workers commuting to Germany, including reduced duration and increased costs for border crossing permits and enforcing customs restrictions on cross-border monetary flows, in particular after early 1943. These actions reduced the financial inducements to work in Germany and accelerated the decline in numbers of Swiss transitory workers. This contradiction suggests that Switzerland was attempting to treat the belligerents more equally than the 1939 agreement initially suggests.

Trends for Swiss transitory labour behaved like those for German workers in Baden until 1943. As Table 5 demonstrates, between January 1940 and 1943, the number of Swiss transitory workers in Germany and the total number of workers in Baden closely correlate; the number of Swiss workers in Baden declined 15% more slowly over this period than the total workforce in Baden (January 1941=100).⁶⁸ Some of this difference can be explained by the shortage of skilled labour and the German desire to retain higher-skilled workers, including the Swiss.⁶⁹ Thus, although Germany often sought to exploit the area, Swiss transitory workers ultimately left their posts about as often as their German counterparts until 1943.⁷⁰

The relative decline of Swiss workers from 1943-1945 accelerates in comparison to other labour groups in Baden.⁷¹ This relates directly to a second wave of changes in the rules for Swiss authority permits, which encouraged the Swiss to leave their jobs more readily than did their counterparts. Table 5 suggests a 29% decline in the number of Swiss transitory workers from 1943 -1944, compared to an increase of 8% in the total number of workers in Baden. The decline in the number of Swiss working in the German *Klein Grenzgebiet* from 1943 onwards is related to informal Swiss policy changes, designed to reduce the incentives for working in Germany.

The changes increased the transitory workers' costs and thus lowered their net earnings. The 1939 agreement required identity/permit cards called *Grenzkarte* for all transitory visitors, but allowed each country to regulate these border permits as those chose.⁷² In November 1941, two-year Swiss permits dropped to three-months at most. After mid-1942, the local Swiss

⁶⁷ Meier et al, *op. cit.*, p.409.

⁶⁸ Table 5; Peter, *Rüstungspolitik*, p.336.

⁶⁹ *Ibid.*

⁷⁰ NARA RG242/T-77/243/986448-986453

⁷¹ Peter, *Rüstungspolitik*, p.336.

⁷² BA R E1070/1000-34/123 agreement dated 9 March 1939.

authorities charged two Swiss Francs for each permit.⁷³ These changes increased the costs of the original permit by between 8 and 24 times, depending on its duration. At worst, workers could then spend up to 20% of their earnings on permits, as compared to less than 1% before.⁷⁴ These increased costs should have discouraged transitory labour.

The Swiss government started also to enforce its customs allowances strictly. Before the war, workers earning more than ten Reichsmarks (17.5 Swiss Francs) per week were able to supplement the transmission of their cash earnings with consumer goods. Duty-free goods included valuable items such as up to 125g of sugar, 49g of coffee, 49g of chocolate, 49g of cocoa powder and various meats.⁷⁵ However, after 1941, increasing shortages in Germany forced all earnings to be remitted in cash. This prevented Swiss workers from remitting all their earnings, which would have exceeded the cash transfer limits.

Unable to use costly consumer goods to transmit their earnings, workers earning more than 17.5 Swiss Francs per working day effectively forfeited some of their pay every week.⁷⁶ An average week's wages of approximately 75 Swiss Francs could have taken five working days to remit;⁷⁷ skilled workers earning above the average (over 100 Swiss Francs a week for a male skilled worker) would have lost part. The Germans tried to increase these cash payment remittance limits, but the Swiss agreed to the changes only for pensioners and travellers, not labourers.⁷⁸ The limitations on remittances and increased costs for *Grenzkarte* were clearly enough to slowly dissuade these Swiss workers from commuting to work as before.

Conclusions

Swiss-German exchanges of labour within the *Klein Grenzgebiet* ultimately benefited the Germans. This study demonstrates a small net outflow of highly-skilled labour from Switzerland to Germany during the Second World War. The Germans provided Switzerland with largely unskilled female labour while Germany gained a disproportionate number of skilled male workers. The net contribution of the worker exchanges over the entire period represents less than 0.28% of Swiss 1938 NNI, but its impact on German production for specific wartime specialty items cannot be discounted.⁷⁹ Swiss transitory labour working in German war factories produced critical items: metals, machines and other specialized products. Swiss even-handedness is marked by this one-sided contribution to the German war effort: although very small, the Swiss made the Germans a net contribution three times greater than they received, but no such contribution to the Allies.

However, despite allowing Swiss citizens to contribute by working for the German war effort, the Swiss government did limit the size and scale of the contribution. Although the Swiss

⁷³ StAZH BEZ/AND/134/2-3.

⁷⁴ See Appendix B.

⁷⁵ BAr E1070/1000-34/123, agreement dated 9 March 1939.

⁷⁶ *Ibid*; BAr E7160-01/1968-223/249, undated memo marked "Bericht über die Grenzverkehrsverhandlungen mit Deutschland vom 10. bis 13. August" [Report on the Frontier Traffic Negotiations with Germany from 10 to 13 August].

⁷⁷ Assumes average quarterly wage of approximately 900 Swiss Francs as suggested by Appendix B.

⁷⁸ NARA RG242/T-77/152/887810.

⁷⁹ Appendices A and B; Meier, *op. cit.*, p.409.

Federal government authorized pro-German changes to the operation of the *Klein Grenzgebiet* zone only two days before the war began, Swiss local authorities sought to restrict worker movements. Rules and restrictions designed to limit worker transfers were enforced; permits became more expensive and worker transfers were restricted by the ability to remit earnings. Consequently, the economic inducement to work in Germany slowly dissipated for most Swiss during the war.

The story of Swiss labour in Germany suggests the Swiss government wanted to maintain favourable relations with Germany by preserving existing interests, while also preventing Germany from gaining large numbers of Swiss workers. The seemingly confusing dual policy of agreeing to and ratifying the new Treaty governing the *Klein Grenzgebiet* while also increasing the costs for Swiss transitory workers in Germany allowed the Swiss government to fulfil these goals. Existing Swiss workers could maintain their employment and transmit their earnings to Switzerland in cash; however, over the long-term these and other workers would be more likely to take up work at home as comparative employment trends improved. Thus, the Swiss government maintained positive relations with Germany and the illusion that they could provide the thousands of workers needed for the German war effort, all the while restricting worker flows and maintaining their independence.

Bibliography

Primary Sources

Eidgenössischen Statistisches Amt, *Statistisches Jahrbuch der Schweiz* [Statistical Yearbooks of Switzerland], 1938-1946 (Basel, various years)

Länderrat des Amerikanischen Besatzungsgebietes [American Occupation Government] (ed.) *Statistisches Handbuch von Deutschland* [Statistical Handbook of Germany], 1936-1952 (Munich, 1949)

Swiss Federal Railways, *Horaire Suisse 1943* [Swiss Rail Timetable 1943] (Zurich, 1942)

Schweizerische Bundesarchiv (BAr), Bern, Switzerland

E1070	1000/34	Volume 123
E2001D	1000/1152	Volumes 38
E7160-01	1968/223	Volume 249
E3320B	1000/773	Volume 22
E6351F	1000/1044	Volumes 489-493
	1000/1046	Volume 12

Archives of Canton Aargau (StAAG)

BA.09.0596	BA.09.0692	BA.09.0693
BA.09.0694	BA.09.0695	BA.09.0706
DIA03.0306	DJ02.0188/18	DJ03.0444

Archives of Canton Basel Stadt (StABS)

PD-REG 8c (1) 2-1:3 1939-1948

Archives of Canton Zürich (StAZH)

Z6.6098
BEZ/AND/134/3
BEZ/AND/134/2

Archives of Canton Schaffhausen (StASH)

Polizei E24-E26	Polizei F1
Polizei F2	Polizei F4
Polizei F11	RRA 6/182900

Archives of the Ministerio de Asunto Exteriores y de Cooperación [Spanish Foreign Ministry] (AMAEC), Madrid, Spain

R2225/1

Imperial War Museum, Duxford (IWM-D)

FD847/46

National Archives and Records Administration (NARA), College Park, Maryland, USA

RG242 Captured German Records

T-77/35-36

T-71/97

T-73/49-53

T-73/95
T-77/167
T-77/252

T-73/100
T-77/243-44
T-77/289

T-77/152
T-77/247
T-77/885

Bundesarchiv-Militärarchiv, Freiburg (BA-MA)

RW20/5-7-18

Published Sources

Direktorium der Gesellschaft ALAG (ed.) *Geschichte der Aluminium Industrie AG, Neuhausen 1888-1938*, 2 volumes, (Zurich, 1942-1943)

Homze, Edward. *Foreign Labour in Nazi Germany* (Princeton, 1967)

Kleisl, Jean-Daniel. *Electricité Suisse et Troisième Reich* [Electricity in the Third Reich] (Zurich, 2001)

Peter, Roland, Myriam Rais-Liechti and Christian Ruch. *Geschäfte und Zwangsarbeit: Schweizerische Industrieunternehmen im Dritten Reich* [Business and Forced Labour in Swiss Industries in the Third Reich] (Zurich, 2001)

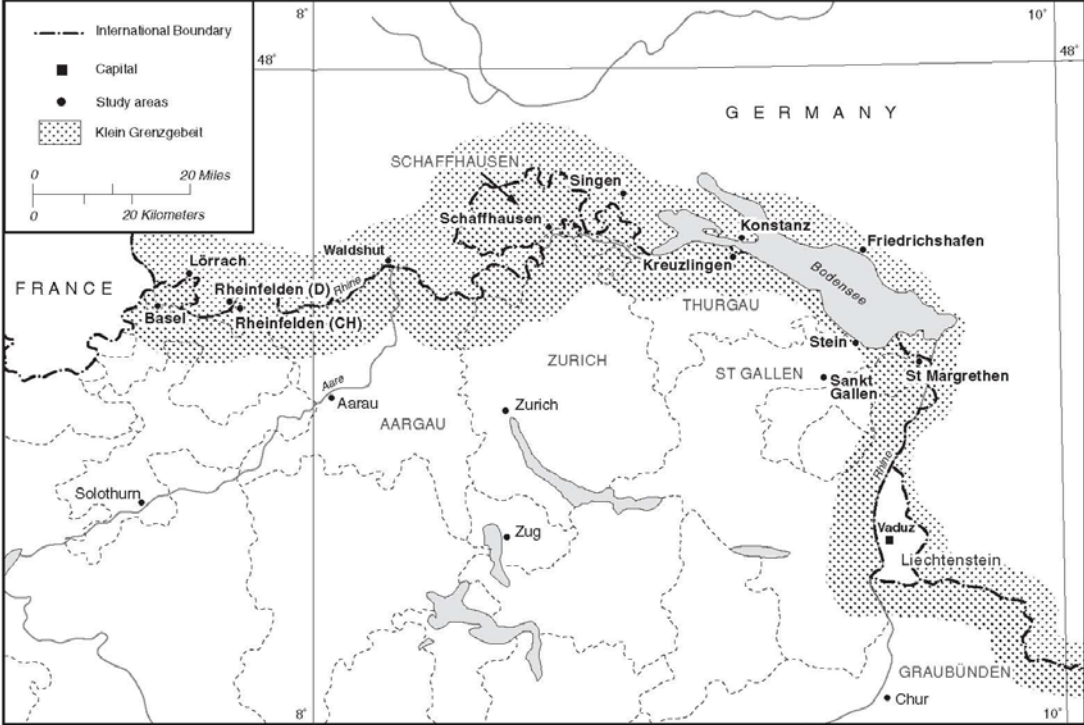
Rauh, Cornelia. *Schweizer Aluminium für Hitlers Krieg?* [Swiss Aluminium for Hitler's War] (Munich, 2009)

Meier, Martin, Frech, Stefan, Thomas Gees, and Blaise Kropf. *Schweizerische Außenwirtschaftspolitik 1930-1948* [Swiss Foreign Trade Policy 1930-1948] (Zurich, 2001)

Spoerer, Mark. *Zwangsarbeit unter dem Hakenkreuz: Ausländische Zivilarbeiter, Kriegsgefangene und Häftling im Deutschen Reich und im besetzten Europa 1939-1945* (Stuttgart, 2001)

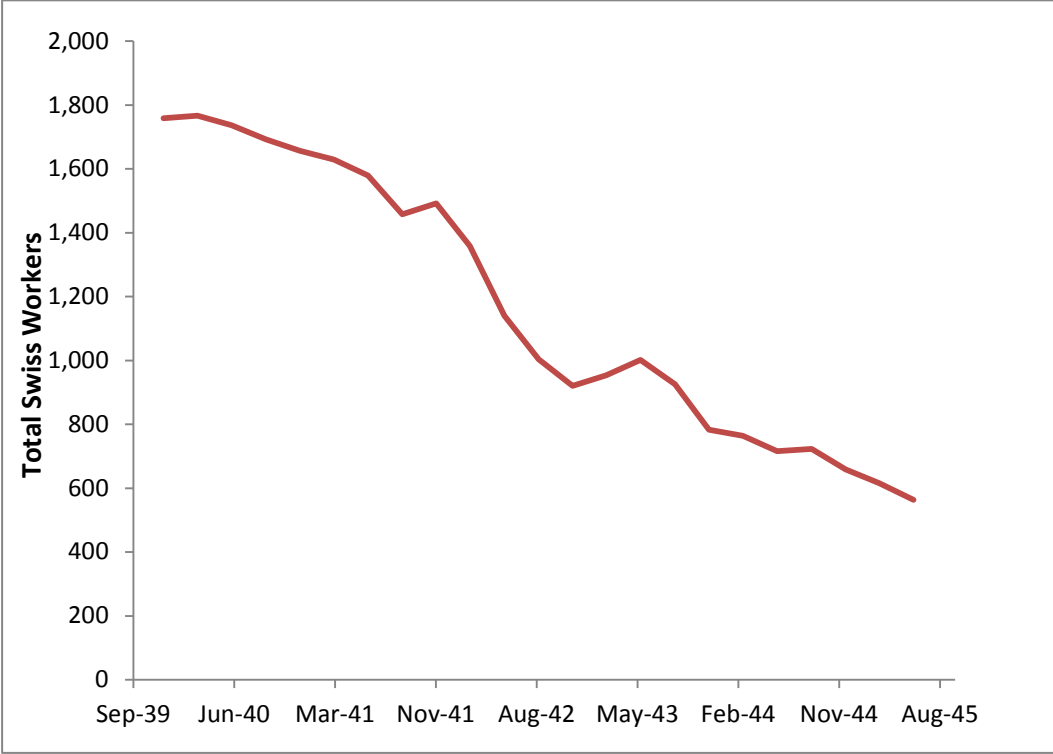
Wipf, Hans Ulrich. *Georg Fischer AG, 1930-1945: Ein Schweizer Industrieunternehmen im Spannungsfeld Europas* [Georg Fischer, 1930-1945: A Swiss Industrial Company in the European Conflict Zone] (Zurich, 2001)

Figure 1: Swiss-German *Klein Grenzgebiet*, 1939, with internal Swiss borders



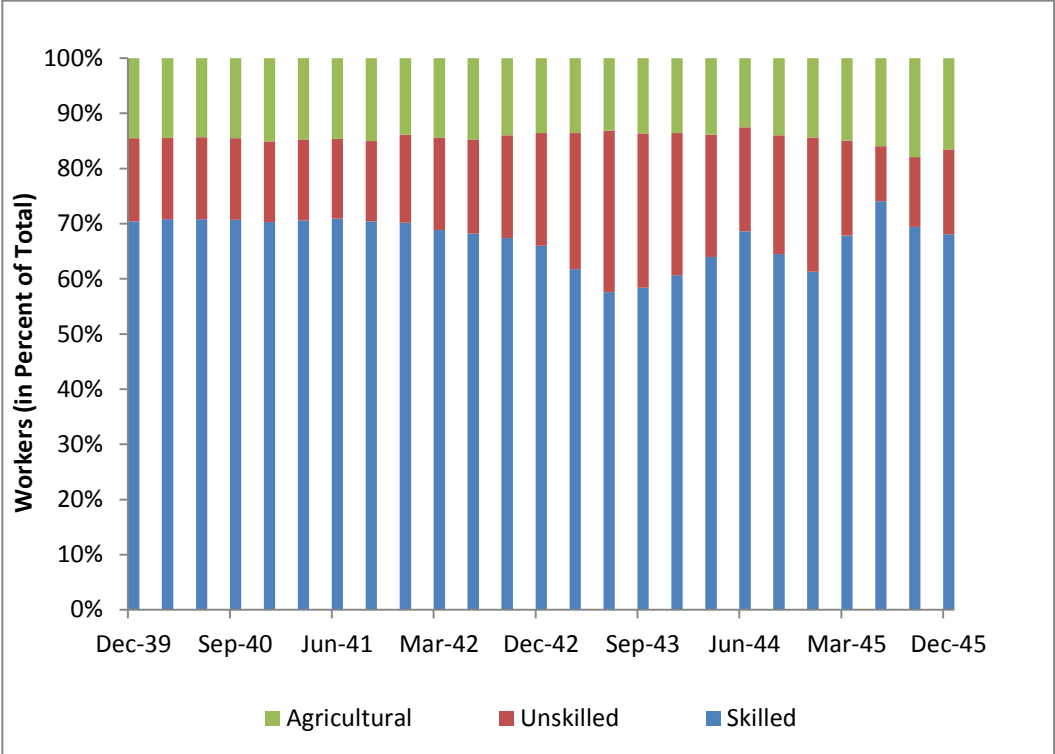
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Figure 2: Swiss Transitory Labourers in Germany, December 1939 to June 1945



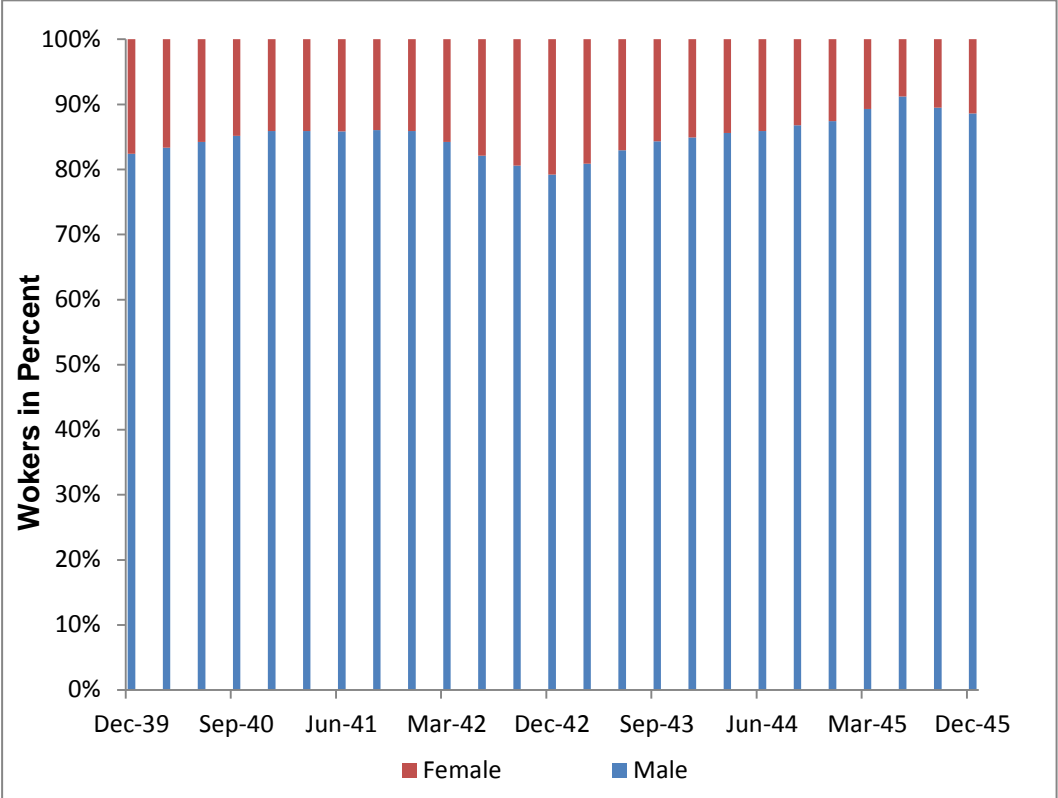
Sources: See Table 3

Figure 3: Swiss Residents Working in Germany, by Skill Type, December 1939 to December 1945



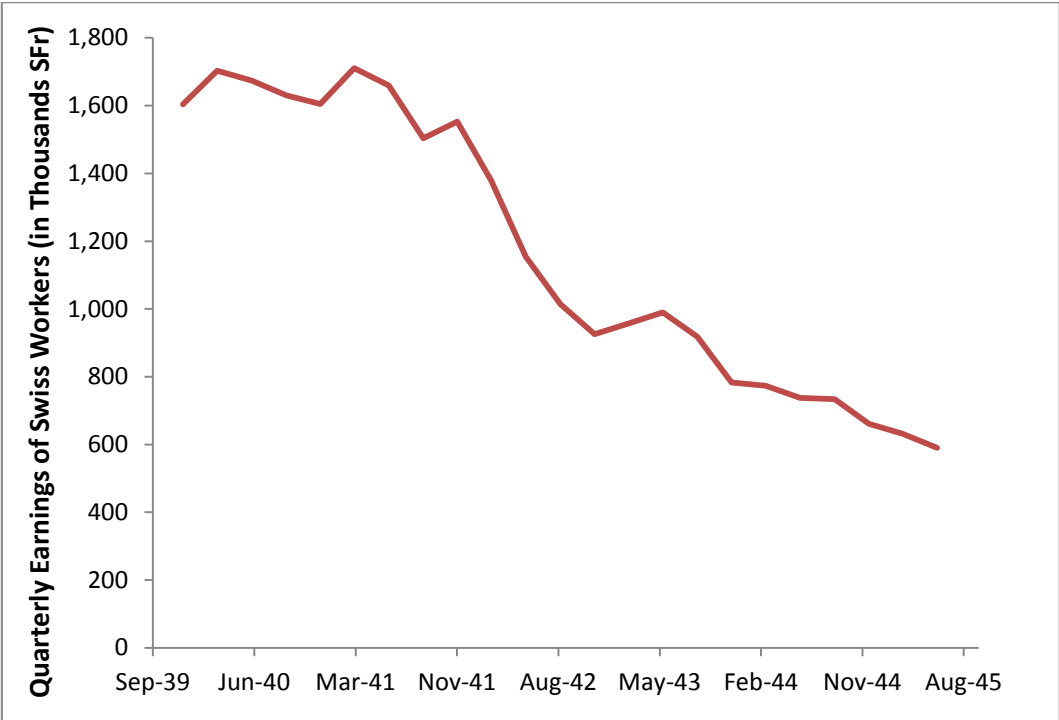
Sources: See Appendix A.

Figure 4: Gender Distribution of Swiss Residents Working in Germany, December 1939 to December 1945



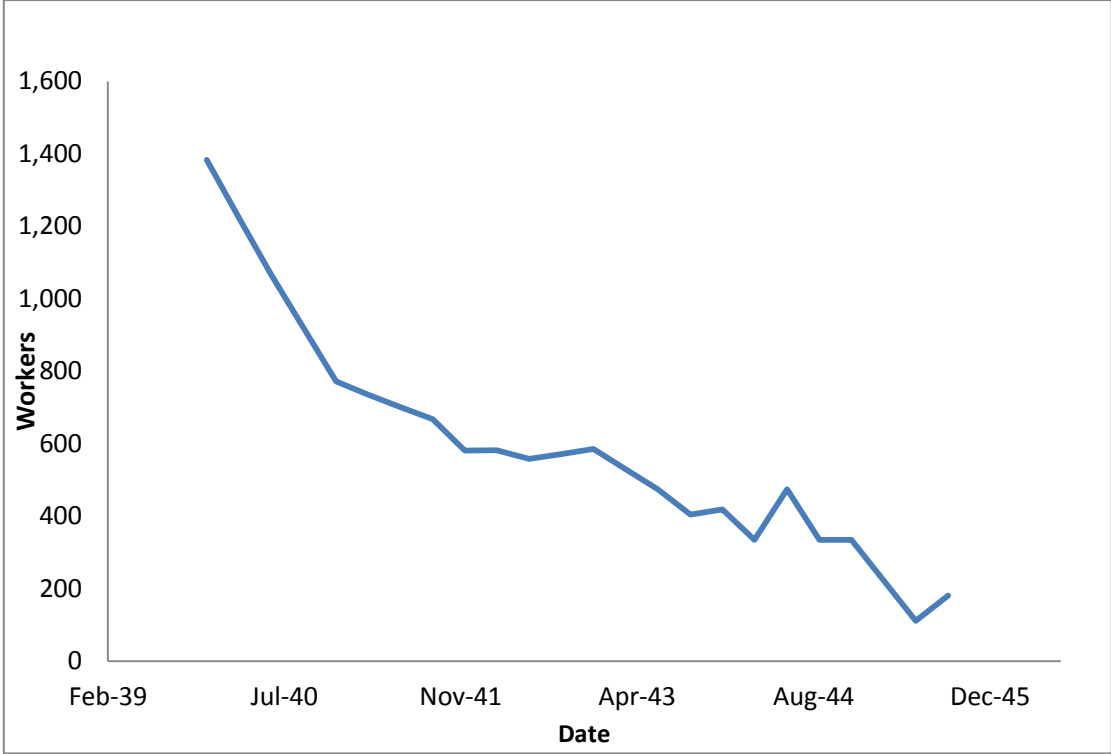
Sources: See Appendix A

Figure 5: Total Quarterly Earnings of Swiss Residents Working in Germany, December 1939 to August 1945



Sources: See Appendix A; based on assumptions explained in the text.

Figure 6: German Transitory Labourers Working in Switzerland, December 1939 to June 1945



Sources: see Table 4.

Table 1: Sources for Swiss Worker Figures, by Canton

Canton	Swiss Workers in Germany	German Workers in Switzerland
Basel Stadt (BS)	Basel-Stadt Police through April 1940; then based on Aargau/Zürich trends	Basel-Stadt Police through April 1940; then based on Aargau trends
Aargau (AG)	Bi-annual foreign labour surveys	Bi-annual foreign labour surveys
Zürich (ZH)	<i>Grenzkarte</i> log books, maintained by Police	1943 Swiss Federal Report;
Schaffhausen (SH) Thurgau (TH) St.Gallen/Graubünden (SG/GR)	Based on relative Federal Trade Statistics, November 1939 with 1940-1946 trends estimated from Aargau and Zürich	Aargau trends used for 1939-1943 and 1943-1946

Table 2: Labour Force in Baden *Klein Grenzgebiet*

Kreis District Number	Capital	Number of Workers	Est. High Skilled	Est. Metal Workers
Baden-11	Lörrach	2,784	720	270
Baden-8	Säckingen	2,754	825	550
Baden-3	Waldshut	1,771	890	355
Baden-27	Donaueschingen	4,134	2,730	1,030
Baden-18	Konstanz	13,507	6,100	1,300
Total		24,950	11,625	3,505

Sources: Bundesarchiv-Militär Archiv, Freiburg (BA-MA), RW 20-5/51-57; Peter, *Rüstungspolitik in Baden*, p.92.

Table 3: Swiss Transitory Labour in Germany by Original Canton
Overall Statistics by Quarter

Date	Total Workers Switzerland to Germany	Basel- Stadt	Aargau	Zürich	Schaff- hausen	Thurgau	St.Gallen and Graubünden
Dec-39	1,759	326	130	190	130	972	11
Mar-40	1,767	308	127	201	132	988	11
Jun-40	1,737	303	124	199	130	971	11
Sep-40	1,692	295	120	194	126	946	11
Dec-40	1,657	289	117	191	124	926	10
Mar-41	1,630	284	119	183	122	912	10
Jun-41	1,579	276	120	170	118	885	10
Sep-41	1,458	255	122	142	110	819	9
Dec-41	1,492	262	131	137	112	840	10
Mar-42	1,358	239	122	121	102	766	9
Jun-42	1,140	201	113	87	86	645	7
Sep-42	1,004	177	102	74	76	569	6
Dec-42	920	162	90	72	70	521	6
Mar-43	954	168	92	77	72	539	6
Jun-43	1,001	176	93	85	76	565	6
Sep-43	925	163	90	73	70	523	6
Dec-43	783	139	87	47	60	445	5
Mar-44	764	136	86	45	58	435	5
Jun-44	716	127	84	37	55	409	5
Sep-44	723	128	74	52	55	410	5
Dec-44	658	116	64	52	50	372	4
Mar-45	616	108	52	60	46	346	4
Jun-45	563	98	39	66	42	315	4
Sep-45	1,418	244	58	221	105	782	9
Dec-45	1,451	251	77	202	108	805	9

Sources: See text (previous discussion of archival sources.)

Table 4: Germans Working in Switzerland, by Canton, December 1939 to December 1945

Date	Total Workers: Germans in Switzerland	Basel- Stadt	Aargau	Zürich	Schaff- hausen	Thurgau	Cantons St.Gallen and Graubünden
Dec-39	1,384	938	46	108	12	97	183
Mar-40	1,225	831	41	96	10	86	161
Jun-40	1,065	724	36	83	9	75	139
Sep-40	919	617	30	71	8	64	129
Dec-40	772	510	25	59	6	53	119
Mar-41	736	490	24	56	6	50	110
Jun-41	702	469	23	54	6	48	101
Sep-41	667	449	22	52	6	46	93
Dec-41	581	388	19	45	5	40	85
Mar-42	583	408	20	47	5	42	61
Jun-42	558	408	20	47	5	42	36
Sep-42	572	418	21	48	5	43	37
Dec-42	586	428	21	49	5	44	38
Mar-43	530	388	19	45	5	40	34
Jun-43	474	347	17	40	4	36	31
Sep-43	405	296	15	34	4	30	26
Dec-43	419	306	15	35	4	32	27
Mar-44	335	245	12	28	3	25	22
Jun-44	474	347	17	40	4	36	31
Sep-44	335	245	12	28	3	25	22
Dec-44	335	245	12	28	3	25	22
Mar-45	223	163	8	19	2	17	14
Jun-45	112	82	4	9	1	8	7
Sep-45	181	133	7	15	2	14	12
Dec-45	251	184	9	21	2	19	16

Sources: see text (previous discussion of archival sources.)

Table 5: Index of Comparative Labour Trends in Baden (January 1941=100)

January of Year	Swiss Workers in Baden	Total Workers in Baden	Total German Workers in Baden	Foreign Workers in Baden	Georg Fischer Workers in Singen Plant
1940	109				102
1941	100	100	100	100	100
1942	72	80	78	164	80
1943	63	58	53	292	67
1944	45	63	56	361	61

Sources: Peter, *Rüstungspolitik in Baden*, p.336; Wipf, *Georg Fischer*, p.330; Appendix A.

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