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Harbingers of Dissolution?
Grain Prices, Borders and Nationalism
In the Hapsburg Economy
Before the First World War

Max-Stephan Schulze & Nikolaus Wolf

Department of Economic History
London School of Economics

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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

Harbingers of Dissolution? Grain Prices, Borders and Nationalism in the Habsburg Economy before the First World War[1]

Max-Stephan Schulze & Nikolaus Wolf (FU Berlin)

Abstract

This paper explores the pre-First World War Austro-Hungarian economy as a prominent case where growing conflict between various ethnic and national groups within an empire might have contributed to the emergence of internal borders and even its eventual dissolution. To this end we adopt an Engel-and-Rogers–type approach to examine on an annual basis the extent of co-movements in grain prices across a sample of ten regional capital cities in the empire and over the period 1877-1910. There are two key findings. First, the political borders that emerged from 1918 onwards became visible in the price dynamics of grain markets already 20 years before the *Great War*. Second, this effect of a "border before a border" can be explained by the extent of language heterogeneity across the various parts of the Habsburg Empire. These results raise several important questions about both the forces that shaped pre-war market integration as well as the economic costs of breaking up the Habsburg customs union after 1918.

I. Introduction: Did 'national' borders matter in a 'multi-national' empire?

This paper, and the question it poses, is motivated by two fairly distinct literatures. There is, first, an extensive historiography, reaching right back into the years immediately after the First World War, that examines the origins and impact of nationalism in the former Habsburg Empire as a multi-national state (recent work includes, for instance, Berend 2003; Rudolph and Good 1992). Yet most of this historical literature has a lot more to say on the political consequences of

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nationality conflicts within the empire than on their economic dimensions. In other words, we know very little about the extent to which, say, the Czechs or Germans or Hungarians were conditioned in their economic actions by language, nationality or loyalty to their region and how behavioural patterns along these lines changed over time.

Second, there is a strand in the recent applied economics literature that views *political* borders as having a strong effect on both trade flows (McCallum 1995, Anderson and van Wincoop 2003; Wolf 2005) and price dynamics (Engel and Rogers 1996), even after the removal of tariff barriers and controlling for exchange rate volatility or other macroeconomic variables (Engel, Rogers, and Wang 2003; Trenkler and Wolf 2005). Efforts to explain that 'border effect" have focused on the role of business and social networks (Combes et al. 2004), drawing on a slightly older literature that stresses the trade creating effects of such networks (Rauch 2001, also Greif 1993). Hence, there seems to be a tension between trade creation through networks and its flipside, namely trade diversion across such networks.

This paper seeks to explore the Austro-Hungarian customs union in the four decades or so before 1914 as a prominent case where growing conflict between various ethnic and national groups within an empire might have contributed to the emergence of internal borders and even its eventual dissolution. To this end we examine on an annual basis the extent of co-movement in grain prices across a sample of ten regional capital cities in the empire and over the period 1877-1910. The key issue we pursue here is whether the post-World War I boundaries between the empire's successor states became already 'visible' in the pre-war price data. Crudely put, the idea is to see whether economic agents showed any preference to deal with others in the same region or of the same tongue (the latter as a proxy for 'nationality'), or whether such shared characteristics were immaterial to their actions. Employing an Engel-and-

Rogers–type approach to estimate the effects of ethnic and regional borders on price dynamics, controlling for distance and location as well as for period-specific factors, we find that these potential internal borders did not impact on Habsburg grain markets up to about 1895. Thereafter, however, the evidence suggests that there was a large and highly significant 'nationality' or language effect present up until the outbreak of the First World War. In other words, the political borders that emerged from 1918 onwards can be traced in price data already 20 years before the *Great War*.

The rest of the paper is organized as follows. Section 2 briefly sketches out some key issues in the historiographical debate about the significance of 'nationality' conflicts in Habsburg economic development since 1867. Section 3 describes in some detail our dataset, including some descriptive statistics on the ten cities under consideration. In Section 4 we set out our empirical strategy to assess the effects of ethnic and regional borders on price dynamics and document the main results as well as the findings of some robustness analysis. Finally, Section 5 offers a discussion of the economic impact of these regional and ethnic (or linguistic) borders on the Habsburg economy and points to some broader implications.

II. Economic integration, nationalism and the dissolution of Habsburg Empire

At the turn of the 20th century, the Habsburg Empire was among the leading powers of Europe, with a share of roughly 13 per cent in total European population, producing about 10 per cent of Europe's GDP. By the end of the First World War, the empire had militarily, politically and economically collapsed (Schulze, 2005a). The Treaties of St Germain (1919) and Trianon (1920) merely confirmed what had become reality

from late October 1918: the Monarchy was dismembered and its territories were either incorporated into new nation states or ceded to neighbouring countries. Austria and Hungary were reduced to small landlocked rumps, while Czechoslovakia, Yugoslavia and Poland emerged as independent nation states. The lands once tied together in a customs and monetary union were now separated by no less than eleven national borders, quantitative and non-quantitative barriers to trade and different national currencies.

The causes of this collapse are still heavily disputed. Yet nationalism features as a key variable in most approaches, irrespective of whether they adopt a structuralist perspective on imperial decline (Wank, 1997a, b), point to the failure of political elites at the centre to engineer reform and maintain legitimacy (Jaszi, 1929; Taylor, 1948) or focus on the uncompromising pursuit of, effectively, mutually exclusive political aims by the different nationalities in the crownlands (Kornish, 1949; Lieven, 2000). In short, historians have since long argued that the rise of national self-consciousness and growing conflict among the empire's various nationalities, and the failure of the 1867 Constitutional Settlement between Austria and Hungary to offer an institutional arrangement capable of diffusing this conflict, were major factors in the empire's decline. In that view, the First World War was the final blow in a long process of dissolution. Linked to this perspective is the notion that inter-regional inequality and intensifying intra-empire *economic* nationalism undermined the coherence and performance of the Habsburg economy which, ultimately, only served to accelerate the empire's demise in a war it was not economically fit to fight. Oszkár Jászi in his now classic *Dissolution of the Habsburg Monarchy* (1929) put this case most dramatically when he wrote that, 'by 1913, the Austro-Hungarian Monarchy was already a defeated empire from the economic point of view'.

However, there is also a dissenting historiography that fairly emphatically rejects the notion of the empire's fall as inevitable or the Habsburg state as having become unviable. It was losing the war that finished off the empire, but not any insurmountable structural, political or economic problems in the preceding decades (e.g. Sked, 2001). Interpretations along these line are broadly in tune with the findings of the last thirty or so years of research into the economic development of the Habsburg Empire. These make for a less damning assessment of Habsburg economic performance than earlier writing in the field such as, for example, Gerschenkron (1962). Even though economic growth and structural change in the empire were not nearly rapid enough to catch-up with the European leaders before the war (Schulze 2000, 2005b), the work, in particular, of David Good (1984) and John Komlos (1983, 1989) has shown that the origins of Kuznetsian Modern Economic Growth in the western regions of the empire reach back into the 18th century, that growth impulses began to diffuse from the more developed to the less advanced regions and that broad intra-empire market integration across the crownlands made significant progress over the course of the 19th century. The fact that the empire lost the *Great War* and that economic factors played a major role in this tells us that the war it came to fight was of a scale too large to sustain on the basis of resources at its disposal (Schulze, 2005a). It does not necessarily imply that Austria-Hungary's economy was too underdeveloped to maintain the empire's territorial integrity in peacetime (or, for that matter, in times of wars that made less demands on human and economic resources).

Bruckmüller and Sandgruber (2003) observe an apparent contradiction between, on the one hand, increasing inter-regional economic integration within the empire over the 19th century and, on the other, the simultaneous rise of nationalist movements 'based mainly on common language or national consciousness (…) [that] strongly ran

counter to the collective consciousness of belonging to a common state'. Yet the historical evidence on the impact of nationalism on the empire's economy is patchy and ambiguous. For instance, at governmental level, the post-1867 empire had an inbuilt potential breakline: the customs union between Austria and Hungary had to be renegotiated every ten years (and approved by both parliaments) and so had the so-called 'quota', that is the proportion each part had to contribute to the joint budget covering common affairs (largely the army). Berend and Ránki (1967) argue that by the turn of the century the question of an *independent* Hungarian customs area had nearly become the dominant issue in Hungarian politics. However, they emphasize that this was so primarily for political and nationalist reasons rather than on economic grounds. In the end, and despite the political deadlock in Austria's parliamentary process since 1897 that grew out of intensifying nationality conflict, the customs union continued to be renewed, if need be by decree. 'The fact that the Hungarians did not take advantage of this situation [i.e. the political stalemate in the Austrian half of the empire] shows the importance of the Austrian market for Hungarian agricultural producers' (Bruckmüller and Sandgruber 2003).

While the core political and economic interests of the Germans and the Magyars as the dominant groups in the two halves of the empire (without either of them having an absolute population majority in Cis- and Transleithania) were recognized and broadly accommodated in the constitutional compromise of 1867 that established the *Dual* Monarchy, those of the Slavic people in both parts of the empire were not. There is evidence going beyond the mere observation of increasingly pervasive nationalism within the empire that suggests deepening social and economic separation between self-integrating national communities in the decades following the *Ausgleich* (Bruckmüller and Sandgruber 2003). However, the extent of these phenomena, their overall quantitative

significance within the broader context of Habsburg economic development and their role in the empire's eventual dissolution remain problems unresolved (cf. Eddie 1989).

III. Grain Price Data, Languages and Locational Spread

Did ethnic and national conflicts within the empire affect economic relations? Did they provide the fault-lines along which the Empire finally split in the wake of World War One? As suggested by Good (1984) and others, it is at least possible that political efforts to increase the coherence of the empire and its economy through the construction of railways and other measures successfully counteracted tendencies of disintegration.

Here we use price data for four types of grain in ten major cities of the empire to examine this question.[2] The grains are wheat, rye, barley, and oats for which we could find a nearly complete set of annual prices 1877-1909. The main source for the price data are *SJB* and *ÖSH*, augmented by Pribram (1938, on Vienna), Hoszowoski (1934, on Lemberg), Gorkiewicz (1950, on Cracow) and *Preisstatistik* (1913, on Budapest). Correcting for the variation in weight measures used across cities and the change in monetary units varied over time, all prices have been standardized to Austrian Heller per 100 kilogramme. The data are thus comparable both in the cross-section and over time.

The sample of cities and the most prominent regional population characteristics[3] include:

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[2] We are currently incorporating annual observations from a further ten cities in the Hungarian (or 'Transleithaninan') half of the Habsburg Empire to the data set.

[3] For 1880-1910, the Austrian censuses report only the main languages spoken by the regional populations, rather than their nationality or ethnicity. With the exception of Budapest, where nationality data are available, we use the main language spoken as a proxy for the provincial populations' composition by nationality. A comparison of the 1880 language data with the 1857 census data on nationality indicates a very close match even if allowance is made for inter-temporal shifts in the composition. Cf. Horch

(a) Vienna, Linz, Graz, Innsbruck, all of which were in regions with large German majorities and that became part of the post-World War I state of Austria;
(b) Budapest, the centre of Hungary in both its pre- and post-war borders, with a substantial Hungarian majority but significant (though declining) German minority;
(c) Prague in Bohemia where about two thirds of the population were Czech and about one third German, later becoming the capital of Czechoslovakia ;
(d) Cracow and Lemberg in Galicia where more than half the provincial population was Polish and which became part of the future Polish state**;**
(e) Czernowitz in the Bukowina where Ukrainians and Romanian accounted for the largest population shares and which was ceded to Romania after the First World War; finally
(f) Trieste in the Littoral that was dominated by Italians and Slovenes.

Map 1 indicates the geographical location of these cities.

[Map 1 about here]

Table 1 reports in detail the composition of the population by language for all regions surrounding the cities in the sample. The most striking features here are the pronounced linguistic heterogeneity across the major regions within which these cities were located and, in some cases, the shifts in population shares held by the different nationalities.

[Table 1 about here]

(1992) on the relationship between language and (national) identity in the Habsburg context.

For instance, in 1880 only slightly more than half of the population of Budapest was Hungarian, by 1910 this had risen to over 80 per cent while the proportion of the German population had fallen from initially over 30 to less than 10 per cent. A similar if not quite so dramatic development can be observed for the relative increase of the Polish population in Galicia. In one case, the fact that these statistics refer to the whole provinces and not to their respective capital cities can be problematic. Innsbruck is situated in the German dominated northern part of Tyrol, while there is a very strong Italian and Ladinian element in the province south of the Alps. This strongly affects the overall provincial balance and distinguishes it from that prevalent in Innsbruck. We account for this issue in our estimation procedures (see Section IV below).

IV. Empirical Strategy and Econometric Results

We are going to test the hypothesis that an increasing degree of national self-consciousness, and hence of national heterogeneity, affected commodity markets similar to political borders via network effects: two cities with little or no ethnic differences will tend to trade more with each other than cities with larger ethnic differences, because trade networks tend to evolve along social and ethnic contacts (Greif 1993, Rauch and Trinidade 2002). This seems somewhat at odds with Good's (1984) view that the empire became increasingly integrated. Figures 1 and 2 plot the coefficient of variation over the cross-section of our ten cities for each kind of grain, 1877-1909.

[Figure 1 about here]

[Figure 2 about here]

What we see is that, indeed, for wheat, rye, barley, and oats the volatility of prices declined substantially. However, this summary statistic hides the fact that some city pairs integrated far more than others did. To explore this asymmetric integration more systematically, we examine the complete set of price differences between all possible city-pairs in our sample. Based on Engel, Rogers and Wang (2003) we use differences in price levels (in logs) as a dependent variable to capture long-term price deviations. These differences should increase in trade costs, where we distinguish between transportation costs and other cost components that increase in geographical distance on the one hand, and cost components related to existing or even just prospective ethnic or national borders on the other hand. We estimate the following specification:

$$(1) \qquad v_{ij,t}^{k} = c_1 * border_{ij} + c_2 * raildist_{ij} + \sum_{1877}^{1909} time_t * \sum_{1}^{J} location_k + \varepsilon_{ij,t}^{k},$$

where $v_{ij,t}^{k}$ is the log-difference of prices of grain k between cities i and j at time t, *raildist* is the log of km-distance on railways between the two cities, the variables *time* and *location* are a full set of interacted dummies to capture time-specific location factors, while $\varepsilon_{ij,t}^{k}$ is an i.i.d. error component.

In a first step of our analysis we ask whether we can find the fault-lines of political dismemberment already in the pre-war data. To this end we define *border* as a dummy variable which is defined along the post-war borders that separated the monarchy's successor states after 1918:

$$(1) \quad border_{ij} = \begin{cases} 1 \text{ if cities i, j after WWI separated by a border} \\ 0 \text{ else.} \end{cases}$$

The model is estimated by OLS, where we start by pooling over all four types of grain and estimate a set of average coefficients over the complete period 1877-1909. Then we let the coefficients vary between two periods 1877-1895 and 1896-1909, while in a third variant we allow the coefficients to vary in three-year intervals. We also estimate the average and time-specific models pooled over all types of grain and for each kind of grain separately. Table 2 gives these results.

[Table 2 about here]

In general we confirm the hypothesis that price differences can be modelled as a function of two kinds of trade costs. Both, the distance on railway-connections, which serves as a proxy for all kind of distance-related trade costs and the coefficient of our border-dummy are significant in the pooled model. However, the costs related to trading across regional boundaries that subsequently became national borders within the Habsburg Empire seem to increase over time. To put it the other way around: falling into a region that after the war formed part of the same national state, significantly lowered trade costs between any pair of cities from 1895 onwards, but not before. This effect is slightly smaller for wheat than for rye (or barley or oats), which is entirely in line with economic reasoning. The higher the unit value of a good, the higher is usually the trade-margin of that good and hence, the smaller the expected trade-diverting effect of any new trade barrier.

What is driving this emerging border effect? One possibility is, for instance, that increasing inter-regional differences in the density of communications networks followed already before the war the fault-lines of future political dismemberment. If this were the case systematically, it would not be captured in the time-varying distance measure but show up in the estimated coefficient on the border dummy. Another, and in the

Habsburg historiographical context particularly interesting, hypothesis is that nationality conflicts impacted on agents' economic behaviour.

Is the estimated border effect which seems to rise from about 1895 onwards, really an effect of growing tensions between different ethnic groups of the Habsburg Empire? If so, we should be able to explain the border-effect by some measure of ethnic heterogeneity. To this end, we use the language statistics from Table 1 to construct an index of heterogeneity according to the following formula:

$$Langdiff_{ij,t} = \frac{\sum_{k=1}^{n} (a_{i,t}^{k} - a_{j,t}^{k})^2}{n} \quad (2)$$

where $a_{i,t}^{k}$ is the percentage share of language k at province i and time t, and n is the total number of language groups (in our case nine). The index varies between 0 (no differences) and 1 (no similarities) and is therefore comparable to our 0/1 border dummy. If the emerging border was driven by tensions between ethnic groups and if ethnic groups mainly define themselves via language, our index might help to explain the estimated border effect. To test this, we re-estimate (1) replacing the border dummy by our index of language heterogeneity (2). In a next step, we re-estimate the border-effect controlling for language heterogeneity. Table 3 reports the results.

[Table 3 about here]

As hypothesized, language differences essentially capture the estimated border effect. They have a very similar impact on relative price

integration and if we re-estimate the border effect controlling for language heterogeneity, this border effect vanishes.[4]

V. Conclusion: Some Implications and Speculations

The key finding of our preliminary analysis, namely that language matters in explaining price dynamics in the late 19th century Habsburg Empire, raises several important issues.

First, if this evidence of emerging 'national preference' in grain markets can be read as being indicative of broader patterns across the economy (and there is no *a priori* reason to assume that grain traders behaved more or less nationalistically than other economic agents), then its seems likely that product markets overall displayed degrees of integration that were conditioned by, essentially, non-economic considerations. With the coefficient on distance fluctuating but not falling, it is not clear how, in a world of increasing absolute price integration as documented in declining coefficients of variation across the Habsburg regions, the relative costs of trading with others not sharing the same linguistic characteristics per se should have increased over the period 1877-1909 and thus account for the observed shifts. In other words, it does not seem that the rising importance of language heterogeneity merely reflects relatively declining transport costs (i.e. shifts in the composition of transaction costs). Pushed further and located within the context of the empire's domestic market, a generalized national preference argument suggests a reduction in the size of the market

[4] Note that we add a special control for Innsbruck for two reasons: first, while after WWI the city of Innsbruck belonged to the Austrian Republic, most of the province of Tyrol did not. Second, Innsbruck is situated in the predominantly German-speaking northern part of Tyrol, while overall there was a very large Italian population in Tyrol south of the Alps which also shows up in the language statistics and hence, in our index of language differences.

served. Simply put, the number of Czech, German or Hungarian consumers (or producers) is bound to be smaller than their combined total. Collective behaviour characterized by national preference is thus likely to have reduced the scope for the realization of economies of scale and specialization (cf. Koren 1961). In a world with constant or increasing returns this may well have constrained, *ceteris paribus*, the level and growth of output.

Second, the coefficient on inter-regional language differences is positive and significant from the mid-/late 1890s onwards, but not before. This is broadly consistent with the findings of the political historiography that stresses the *rise* in intra-empire ethnic conflict from the late 1880s and, in particular, the political deadlock between the Czechs and Germans from the 1890s (Sked, 2001; Kornish, 1949). In light of these profound political conflicts it does not seem too far-fetched to hypothesize that agents' economic behaviour began to follow essentially political criteria.

Third, one might argue in the spirit of Alesina and Spolaore (2003) that the observed process of disintegration is evidence in favour of a triangular interaction between economies of scale, costs of heterogeneity and economic integration. In their simple model the optimal size of states is determined by a trade-off between economies of scale in the provision of public goods such as means of payment or the enforcement of commercial laws on the one hand, and the costs of heterogeneous preferences about the quality of these public goods on the other. In this framework an exogenous increase in heterogeneity, due to, say, some diffuse "awakening of national self-consciousness" may have directly created separatist movements in parts of the Empire. However, on top of that and more interestingly, their model predicts that a perceived increase in world-wide integration during the period up to the First World War may have changed the expected costs and benefits of having a separate

nation state for the actors of such separatist movements. The probability of survival for small countries depends crucially on their access to markets outside their national borders. Put differently, while in the short run separatism created new barriers to trade, the very fact that people observed a decline in world transport costs might have fuelled the hopes of smaller ethnic groups to have their own national state.

Fourth, the new evidence suggests that grain markets in the pre-First World War period integrated increasingly along linguistic lines. For sure, regional boundaries did not coincide with linguistic boundaries as shown in Table 1 (herein lies, after all, the rationale of using language variables), but the pre-war regional borders within which certain languages dominated matched very well with what became post-war national borders. The key issue then is that for the years prior to the First World War we observe a re-alignment in relative market integration that seems to anticipate the post-war political settlement and the formation of the Habsburg successor states. One implication of this result is that the economic costs of breaking up the Habsburg customs union after the First World War may have been smaller than thought so far since market integration evolved already before the war into a pattern broadly compatible with the post-war political re-alignment. This finding complements recent research on Poland's unification after the First World War (see Wolf 2005; Trenkler and Wold 2005) showing that the former borders that divided the new Polish state persistently affected economic life for another fifteen years or so after their removal. The shock of the new borders that rearranged the map of Central Europe since 1914-18 had its harbingers already twenty years before it materialized.

References

Alesina, A. and E. Spolaore (2003), *The Size of Nations* (London).

Anderson, J. and E. van Wincoop (2003), 'Gravity with Gravitas: A Solution to the Border Puzzle', *American Economic Review* 93 (1), pp. 170-192.

Berend, I.T. (2003), *History Derailed. Central and Eastern Europe in the Long Nineteenth Century* (Berkeley, CA).

Berend, I.T. and G. Ránki (1967), 'Economic Factors in Nationalism: the Example of Hungary at the Beginning of the Twentieth Century', Austrian History Yearbook 3, pp.163-188.

Bolognese-Leuchtenmüller, B. (1978), *Bevölkerungsentwicklung und Berufsstruktur, Gesundheits- und Fürsorgewesen in Österreich 1750-1918* (Munich).

Bruckmüller, E. and R. Sandgruber (2003), 'Concepts of Economic Integration in Austria During the Twentieth Century', in A. Teichova and H. Matis (eds.), *Nation, State and the Economy in History* (Cambridge), pp.159-180.

Combes, P.-P., M. Lafourcade, and T. Mayer (2004), 'The trade-creating effects of business and social networks: Evidence from France', *Journal of International Economics* 66 (2005), pp. 1-29.

Eddie, S. (1989), 'Economic Policy and Economic Development in Austria-Hungary, 1867-1913', in P. Matthias and S. Pollard (eds.), *The Cambridge Economic History of Europe*, vol. VIII, pp.814-886.

Engel, C. and J. Rogers (1996), 'How Wide is the Border?', *American Economic Review* 86 (5), pp. 1112-25.

Engel, C., J. Rogers, and S.Y. Wang (2003), 'Revisiting the Border: An Assessment of the Law of One Price Using very Disaggregated Consumer Price Data', Board of Governors of the Federal Reserve System, *International Finance Discusssion Papers*, No 777.

Gerschenkron, A. (1962), *Economic Backwardness in Historical Perspective* (Cambridge, MA).

Good, D.F. (1984), *The Economic Rise of the Habsburg Empire, 1750-1918* (Berkeley, CA.).

Gorkiewicz, M. (1950), 'Ceny w Krakowie w latach 1796-1914', *Badania z Dziejow Spolecznych I Gospodarczych* 16 (1950).

Greif, A. (1993), 'Contract Enforceability and Economic Institution in Early Trade: The Maghribi Traders Coalition', *American Economic Review* 83 (3), pp. 525–548.

Horch, M. (1992), 'Language and Identity', in R.L. Rudolph and D.F. Good (eds.), *Nationalism and Empire. The Habsburg Empire and the Soviet Union* (New York), pp.65-76.

Hoszowski, S. (1934), 'Ceny we lwowie w latach 1701-1914', *Badania z Dziejow Spolecznych I Gospodarczych* 13 (1934).

Jászi, O. (1929), *The Dissolution of the Habsburg Monarchy* (Chicago).

Komlos, J. (1983), *The Habsburg Monarchy as a Customs Union. Economic Development in Austria-Hungary in the Nineteenth Century* (Princeton).

Komlos, J. (1989), *Stature, Nutrition and Economic Development in the Eighteenth Century Habsburg Monarchy: The 'Austrian' Model of the Industrial Revolution* (Princeton).

Koren, S. (1961), 'Die Industrialisierung Österreichs', in W. Weber (ed.), *Österreichs Wirtschaftsstruktur gestern – heute – morgen*, vol. I (Berlin), pp.223-549.

Kornish, S.G. (1949), 'Constitutional Aspects of the Struggle between Germans and Czechs in the Austro-Hungarian Monarchy', *Journal of Modern History* 21, pp.231-261.

Lieven, D. (2000), *The Russian Empire and its Rivals* (London).

McCallum, J. (1995), 'National Borders Matter: Canada-US Regional Trade Patterns', *American Economic Review*, 85 (3), pp. 615-23.

MSE: Magyar Kir. Központi Statisztikai Hivatal, *Magyar Statisztikai Évkönyv, 1872-1915* (Budapest).

ÖSH: k.k. Statistische Central-Commission, *Österreichisches Statistisches Handbuch*, *1883-1915* (Vienna).

Preisstatistik (1913): Központi Statisztikai Hivatal, *Preisstatistik* (Budapest).

Pribram, A.F. (1938), *Materialien zur Geschichte der Löhne und Preise in Österreich*, vol. I (Vienna).

Rauch, J. (2001), 'Business and Social Networks in International Trade', *Journal of Economic Literature* 39 (2001), pp. 1177-1203.

Rauch, J. and V. Trinidade (2002), 'Ethnic Chinese Networks in International Trade', *Review of Economics and Statistics* 84(1), pp. 116-130.

Rudolph, R.L. and D.F. Good (eds.) (1992), *Nationalism and Empire: The Habsburg Empire and the Soviet Union* (New York).

Schulze, M.S. (2000), 'Patterns of Growth and Stagnation in the Late 19th Century Habsburg Economy', *European Review of Economic History* 4, pp.311-340.

Schulze, M.S. (2005a), 'Austria-Hungary's Economy in World War I', in S. Broadberry and M. Harrison (eds.), *The Economics of World War I* (Cambridge), pp.77-111.

Schulze, M.S. (2005b), 'Origins of Catch-Up Failure. Structural Change and Productivity Growth in the Habsburg Empire, 1870-1913', mimeo, London School of Economics (September 2005).

SJB: k.k. Statistische Central-Commission, *Statistisches Jahrbuch der österreichischen Monarchie*, *1869-1882* (Vienna).

Sked, A. (2001), *The Decline and Fall of the Habsburg Empire, 1815-1918* (Harlow).

Taylor, A.J.P. (1948), *The Habsburg Monarchy 1809-1918: A History of of the Austrian Empire and Austria-Hungary* (London).

Trenkler, C. and N. Wolf (2005), 'Economic Integration across Borders: the Polish Interwar Economy 1921-1937', *European Review of Economic History* 9, pp. 199-231.

Wank, S. (1997a), 'The Habsburg Empire', in K. Barkey and M. von Hagen (eds.), *After Empire. Multiethnic Societies and Nation-Building. The Soviet Union and the Russian, Ottoman, and Habsburg Empires* (Boulder).

Wank, S. (1997b), 'Some Reflections on the Habsburg Empire and Its Legacy in the Nationalities Question', *Austrian History Yearbook* 28, pp.131-146.

Wolf, N. (2005), 'Path Dependent Border Effects: the Case of Poland's Reunification (1918-1939)"' *Explorations in Economic History* 42 , pp. 414-438.

Map 1: The Provinces And Province-Capitals Of The Habsburg Empire Prior To 1914

CISLEITHANIA
1. Bohemia
2. Bukovina
3. Carinthia
4. Carniola
5. Dalmatia
6. Galicia
7. Kustenland
8. Lower Austria
9. Moravia
10. Salzburg
11. Silesia
12. Styria
13. Tirol
14. Upper Austria
15. Vorarlberg

TRANSLEITHANIA
16. Hungary
17. Croatia and Slavonia
18. BOSNIA AND HERZEGOVINA

Table 1: The Heterogeneity of Population – Provincial Population by Language

			Main Language Spoken								
Province	**Provincial Capital**	**Year**	**German**	**Czech/ Slovakian**	**Polish**	**Ukrainian**	**Slovenian**	**Serbo-Croatian**	**Italian**	**Romanian**	**Hungarian**
Lower Austria	Vienna	1880	0,969	0,028	0,001	0,000	0,001	0,000	0,000	0,000	0,000
		1910	0,959	0,037	0,002	0,001	0,000	0,000	0,000	0,000	0,000
Upper Austria	Linz	1880	0,995	0,005	0,000	0,000	0,000	0,000	0,000	0,000	0,000
		1910	0,997	0,002	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Styria	Graz	1880	0,670	0,002	0,000	0,000	0,327	0,000	0,000	0,000	0,000
		1910	0,705	0,001	0,000	0,000	0,293	0,000	0,000	0,000	0,000
Littoral	Trieste	1880	0,021	0,001	0,000	0,000	0,326	0,200	0,453	0,000	0,000
		1910	0,035	0,003	0,001	0,000	0,322	0,206	0,431	0,001	0,000
Tyrol	Innsbruck	1880	0,594	0,001	0,000	0,000	0,001	0,000	0,404	0,000	0,000
		1910	0,621	0,004	0,000	0,000	0,001	0,000	0,373	0,000	0,000
Bohemia	Prague	1880	0,372	0,628	0,000	0,000	0,000	0,000	0,000	0,000	0,000
		1910	0,368	0,632	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Galicia	Lemberg/ Cracow	1880	0,055	0,001	0,515	0,429	0,000	0,000	0,000	0,000	0,000
		1910	0,011	0,001	0,585	0,402	0,000	0,000	0,000	0,000	0,000
Bukovina	Czernowitz	1880	0,191	0,003	0,032	0,422	0,000	0,000	0,000	0,334	0,017
		1910	0,212	0,001	0,046	0,384	0,000	0,000	0,000	0,344	0,013
Budapest*	Budapest	1880	0,343	0,061	0,000	0,000	0,000	0,000	0,000	0,000	0,567
		1910	0,090	0,023	0,000	0,000	0,000	0,000	0,000	0,000	0,861
* Shares reported refer to city of Budapest (i.e. not district or region) and represent nationality rather than main language.											
Sources: Bolognese-Leuchtmüller (1978), pp. 28ff. ; *MSE* (1911).											

Table 2: Impact of Post-war Borders on Pre-war Price Behaviour

		Pooled	Pooled, two periods	Pooled, three-year intervals	Wheat, two-periods	Rye, two-periods
		Coeff. (Stdev)	Coeff. (Stdev)	Coeff. (Stdev)	Coeff. (Stdev)	Coeff. (Stdev)
C1*Border	1877-79	**0.04 (0.01)**	**-0.113 (0.016)**	-0.06 (0.036)	**-0.046 (0.021)**	**-0.113 (0.026)**
	1880-82			-0.09 (0.037)		
	1883-85			**-0.139** (0.036)		
	1886-88			-0.05 (0.036)		
	1889-91			**-0.233 (0.037)**		
	1892-94			**-0.075 (0.039)**		
	1895-97		**0.244 (0.019)**	**0.158 (0.040)**	**0.209 (0.022)**	**0.287 (0.027)**
	1898-00			**0.301 (0.040)**		
	1901-03			**0.273 (0.041)**		
	1904-06			**0.265 (0.039)**		
	1907-09			**0.241 (0.039)**		
C2*Raildist	1877-79	**0.09 (0.01)**	**0.078 (0.009)**	**0.089 (0.011)**	**0.088 (0.012)**	**0.165 (0.015)**
	1880-82			**0.033 (0.012)**		
	1883-85			**0.105 (0.012)**		
	1886-88			**0.070 (0.012)**		
	1889-91			**0.074 (0.012)**		
	1892-94			**0.066 (0.012)**		
	1895-97		**0.113 (0.009)**	**0.091 (0.012)**	**0.099 (0.012)**	**0.148 (0.015)**
	1898-00			**0.107 (0.012)**		
	1901-03			**0.116 (0.012)**		
	1904-06			**0.114 (0.012)**		
	1907-09			**0.114 (0.012)**		
Time* location Dummies		yes	yes	yes	yes	yes
Adj. R2		0.24	0.30	0.32	0.32	0.37
Note: bold print indicates significance at 5 per cent level (or better)						

Table 3: Explaining the Borders by Language Heterogeneity

		Pooled, language	Pooled, borders and language
		Coeff. (Stddev.)	Coeff. (Stddev.)
C0*Langdiff	1877-79	**-1.730 (0.355)**	-0,822 (0.629)
	1880-82	**-2.678 (0.356)**	-3.097 (0.639)
	1883-85	**-3.287 (0.348)**	-4.703 (0.638)
	1886-88	**-1.923 (0.346)**	-2.297 (0.651)
	1889-91	**-3.617 (0.344)**	-3.681 (0.669)
	1892-94	**-1.185 (0.349)**	0.121 (0.683)
	1895-97	**0.843 (0.347)**	0.886 (0.674)
	1898-00	**2.333 (0.349)**	**2.606 (0.683)**
	1901-03	**1.979 (0.346)**	**2.424 (0.695)**
	1904-06	**1.883 (0.340)**	**2.305 (0.695)**
	1907-09	**1.597 (0.326)**	**1.437 (0.683)**
C1*Border	1877-79	-	**-0.191 (0.075)**
	1880-82	-	0.016 (0.076)
	1883-85	-	**0.166 (0.077)**
	1886-88	-	-0.009 (0.079)
	1889-91	-	-0.025 (0.083)
	1892-94	-	**-0.225 (0.088)**
	1895-97	-	-0.068 (0.089)
	1898-00	-	-0.094 (0.092)
	1901-03	-	-0.126 (0.094)
	1904-06	-	-0.121 (0.095)
	1907-09	-	0.001 (0.092)
C2*Raildist	1877-79	**0.153 (0.014)**	**0.127 (0.015)**
	1880-82	**0.112 (0.014)**	**0.087 (0.015)**
	1883-85	**0.192 (0.015)**	**0.168 (0.015)**
	1886-88	**0.141 (0.015)**	**0.117 (0.015)**
	1889-91	**0.157 (0.015)**	**0.129 (0.015)**
	1892-94	**0.120 (0.015)**	**0.088 (0.015)**
	1895-97	**0.130 (0.015)**	**0.105 (0.015)**
	1898-00	**0.133 (0.015)**	**0.106 (0.015)**
	1901-03	**0.146 (0.015)**	**0.119 (0.015)**
	1904-06	**0.145 (0.015)**	**0.118 (0.015)**
	1907-09	**0.145 (0.015)**	**0.116 (0.015)**
Innsbruck-controls		no	yes
Time* location Dummies		yes	yes
Adj. R2		0.32	0.39
Note: bold print indicates significance at 5 per cent level (or better)			

Figure 1: Coefficient of Variation for Wheat and Rye, 10 Cities, 1877-1909

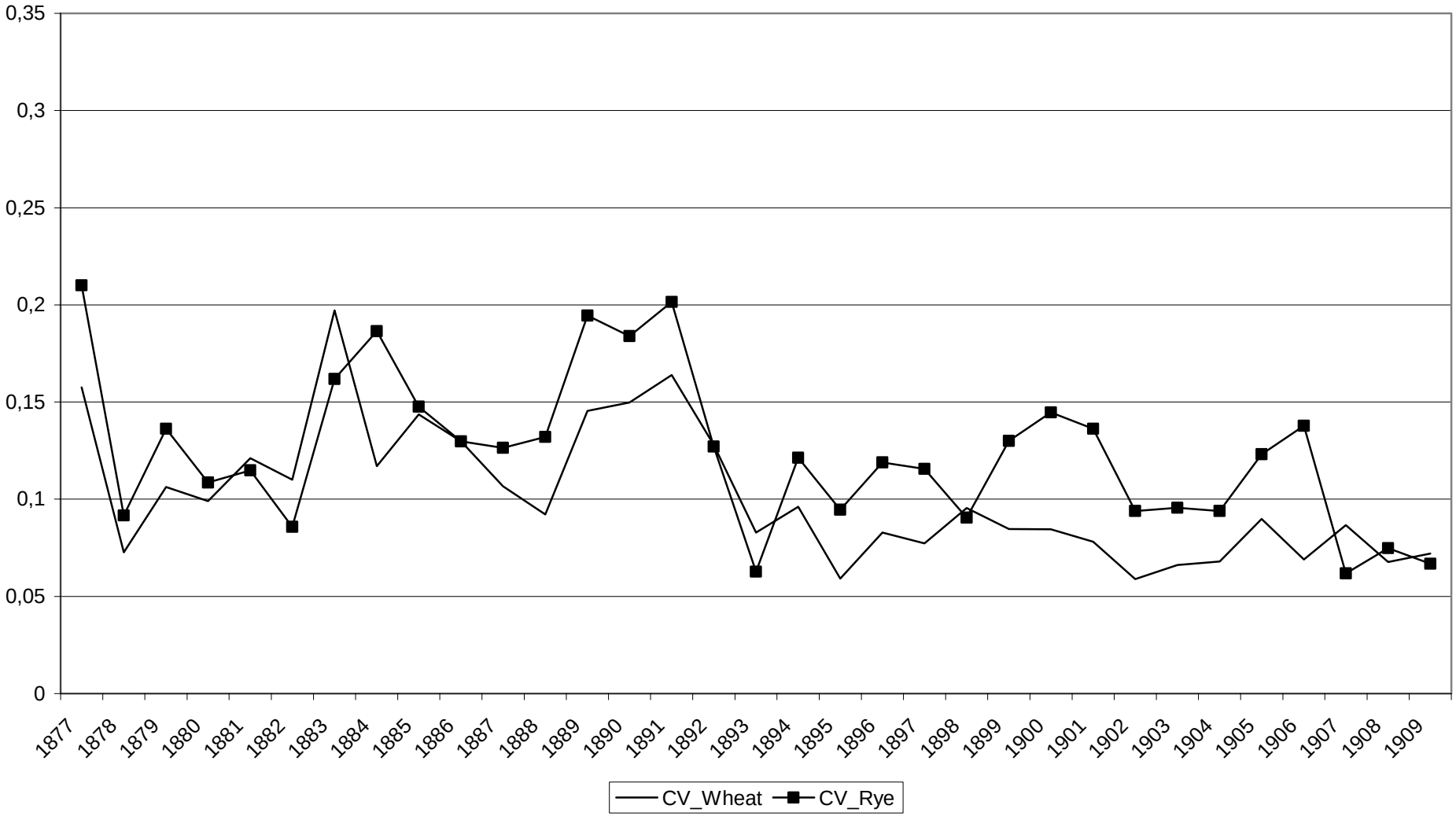

Figure 2: Coefficient of Variation for Barley and Oats, 10 cities, 1877-1909

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