INTERNATIONAL COMPETITION IN ITALY OVER THE XX CENTURY: LIMITS AND EFFECTS

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by M. Gomellini[1]

Abstract

This work computes two measures related respectively to the limits and to the effects of international competition in Italy in the twentieth century. Using bilateral trade data, I calculated an index of *trade costs* that takes into account the whole set of obstacles to international trade. According to this index, the impediments to trade have been high in Italy: on average, over the entire period of analysis, the level of bilateral trade costs amounted to 1.3 in tariff-equivalent terms (i.e., 130 percent). These figures are consistent with those computed in literature for other countries. Trade costs differed in space and time, and proved to be sensibly related to classical determinants (like distance and tariffs). Furthermore, they represented a major limit to trade: their decline accounted for two fifths of the overall bilateral trade increase between 1870 and 2000. Turning to the effects of international competition, I computed a model-based measure of the gains from trade-induced competition, that gauges welfare gains stemming from two sources: more varieties of goods and firms heterogeneity. Using a GDP metrics (compensating variation), I give a quantitative evaluation of the competition-related losses that Italy would have suffered each year in an "extreme" counterfactual scenario of autarky.

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1. Introduction[2]

The issue of international competition gained momentum recently. Mainly one reason lies at the heart of this renewed attention: the globalization process, with the access of BRICs countries to the international arena and the fear of an invasion of goods and firms from these emerging economies, developing fast but still low-wage.

In analysing this topic, economists benefited lately of vast amounts of data collected at the firm/plant level, and benefited also of one the most important theoretical innovation that the field of Economics has faced in the last fifteen years, namely, the new models of international trade with firms heterogeneity inaugurated by Eaton and Kortum (2002) and Marc Melitz (2003) seminal contributions. These models gave formal representation to heterogeneous firms' responses to the increased openness, disclosing new opportunities for empirical analysis.

Along these lines, long run historical investigations are impaired due to the lack of firm-level data.

In this work I will follow mainly two strands of literature that, although being deeply micro-founded, provide statistics that can be used in macro analyses to give an answer to the two research questions about the limits and the effects of international competition.

Thus, I use the following strategy. First, I will engage in a short description of the main turning points in the Italian trade policy over the long run. It should deserve a full long book just for itself, but I'll try to do it in a few pages. This mainly qualitative description of Italy's attitude to free international trade, is then followed by an attempt of giving numbers that measure Italy's protection to international competition (bilateral trade). I will briefly describe the (un)available direct measures ("*remarkably sparse and inaccurate*": Anderson and Van Wincoop, 2004, p.692) and then I focus on a recent indirect measure of *trade costs* derived from micro-founded gravity models. This measure allegedly takes into account all the obstacles a country face in trading internationally and quantifies these obstacles with a *tax-equivalent* measure. Following the work of Jacks, Meissner and Novy (2008), I will examine some determinants of these trade costs and their role in hampering/stimulating the growth of Italy's bilateral trade in the XX century.

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Then I try to deal with the effects of international competition. I will compute a measure of the gains from trade trying to disentangle two of the main channels of gains from trade that emerge from the monopolistic competition literature, namely, more varieties of goods and firms selection (neglecting a third, important one: the pro-competitive effects of trade). In particular, I will perform simple calculations of the aggregate static and dynamic gains from trade-induced competition, and compute a counterfactual real GDP that Italy would have had in different years in a hypothetical zero-foreign competition regime.

2. The limits to trade in Italy: main turning points in trade policy.

A detailed account of the Italian trade policy and of its impacts is beyond the scope of this paper: This paragraph aims only to put the main turning points in trade policy on a timeline (Figure 1).

The history of Italian trade policy since 1861 is definitely complex. Immediately after the Unification the Piedmont liberal tariff (commissioned by Cavour in 1851), was extended to all the provinces of the new Kingdom. It was intended to favor the interests of large landowners by altering the terms of trade between agricultural and industrial products in favor of the first through greater protection[3]. Its adoption was nevertheless followed by a phase in which a more protectionist policy was reaffirmed. In 1863 it was abolished the free trade treaty with France; in 1864 and in 1866 the public finance needs (one of the main causes of trade policy), led to the enforcement of new duties. Only between 1866 and 1871, this process faced of gradual attenuation while, however, industrial interests where strengthening.

With the 1878 tariff reform Italy provided protection to the cotton-textile industry, glass, ceramics, and to a lesser extent to mechanical. In response to the pressing requests for more protection forwarded by industrial and farmers (in particular for the production of cereals), between 1884 and 1886 an Inquiry Commission was set up in order to review duties. This led to the tariff revision of 14 July 1887.

It was a "far more protective tariff […], which imposed high duties on textiles, and (especially) iron and steel products. The duty on yarn amounted to some 27% according to Toniolo (1990, p. 84), as compared with a tariff of just 7% on cloth (implying little or no effective protection for weaving); similarly engineering had to pay for the very high tariffs on iron and steel, without being compensated with high tariffs for its own output. Wheat tariffs were also dramatically increased, amounting to the equivalent of 25% ad valorem in 1885 (James and O'Rourke, 2013: 9). In force

[3] See Toniolo, 1990; James and O'Rourke, 2013 for an overview. The extension of the Piedmont liberal tariff could have affected the north-south divide. The removal of tariff barriers, in particular for industrial goods (protection was almost prohibitive in the South before the Unification) bared the inefficiencies and the fragility of the industrial south. See also Calderoni (1961); Corbino (1931).

until 1921, produced a considerable number of effects, starting with the interruption of trade relations between Italy and France [4].

The protection afforded by the tariff of 1887 was mitigated by the proliferation of bilateral free trade agreements that were extremely important in terms of trade volumes involved, such as the bilateral trade agreements Italy signed in 1904 and 1906 with the 'Austria-Hungary, Germany, Switzerland.

As one of the main tools of intervention to limit or promote international competition, its role and its effects on the process of industrialization and structural change in the Italian economy is one of the most discussed topics in the economic history of the country, in particular with reference to Liberal Italy[5].

Part of the literature showed that from Unification to the WWI outbreak, trade policy was driven mainly by occasional interest lobbying that prevented a strategic formulation consistent with the process of industrialization of the country (Federico and Tena, 1998a).

Federico and Tena (1998b) have shown that duties were not particularly high by European standards and that their impact on the performance of individual sectors was quite small. Also more recent research conducted by James and O'Rourke (2013) share the same conclusions. Trade policy, would have had a modest influence on the economic growth of the late twentieth century and on the industrialization process. The analysis of the degree of effective protection (Federico and Tena, 1998b) at the sectoral level reinforces the idea of a trade policy basically "harmless": Although protectionist measures produced distortive effects, their absence would not have changed the course of Italian economic history (see also Toniolo, 1977).

The following step was the review of the tariff structure in 1921. To understand how Italy came to its adoption some changes caused by the event of war must be considered. In particular, the war had triggered the war industry (mining, iron and steel, machinery, chemical, shipbuilding), creating

[4]The trade war with France "severely damaged the Italian silk and wine industries. Between 1887 and 1897, Italian exports to France fell by 57%, as compared with a 21% decline in bilateral trade in the opposite direction. James and O'Rourke, 2013: 9. See also Federico and Tena, 1998a.

[5] The effects of protectionism in Italy after 1887 are still lively debated among scholars. Fenoaltea (2006) Shows that the return to protectionism produced damage to the Italian economy. Zamagni (1973) minimizes the negative effects stressing the mild effects protectionism had on the development of Italian industry. For empirical analysis on the relationship of long-term relationship between growth and protection, see Clemens e Williamson (2001), Federico e Tena 1999, p.111; cfr. Fenoaltea, 1993; James and O'Rourke, 2013. Toniolo (1977) focus on the relatively small losses caused by the protection of steel. Federico and O'Rourke (2000), by estimating a Computable General Equilibrium (CGE) model for Italy in the year 1911, have come to the conclusion that the effective rates of protection were high in some sectors (e.g., coal and tar, steel-making: see Federico and Tena, 1998) and had important effects on some of these sectors (wheat and sugar production enjoyed the highest level of protection and their output would have changed declining by 53.2% in 1911: James and O'Rourke, 2013, p. 13). Nonetheless, they conclude that overall tariff protection was unimportant, and hardly out of the ordinary, at least in the twenty years running up to 1911(Federico and O'Rourke 2000, p. 29).

strong interest groups pushing towards a higher internal protection. The 1921 new General Tariff[6] raised duties on chemicals, engineering and steel products since WWI had strengthened the arguments of protectionists against free-traders and trade policy was now taking a stance which was more openly in favour of these new industries (Giordano and Giugliano, 2013. See also Calderoni, 1961, p. 152).

Fascist era has traditionally been divided between a more liberal period, covering the early part of the 1920s and one characterised by a more invasive industrial policy between the end of the 1920s and World War Two. In the first part of this Interwar period, the 1921 tariff was watered down, modified with numerous treaties made mainly with European countries (such as France, Switzerland, Austria, Spain, Germany). Between 1922 and 1926, the Finance Minister De' Stefani signed 19 agreements, all aiming at reducing the rate of protection enjoyed by Italian goods abroad. The 1921 tariff was also mildly lowered, so that the average rate of protection on Italian goods fell from 10,3% in 1922 to 8,4% in 1925 (Toniolo 1980, pp. 53-4). De' Stefani's successor, Giuseppe Volpi, increased tariffs, re-introduced the duties on wheat, cereals and their derivatives. It was the beginning of a long period in which there was gradual increase of duties, and a general increasing level of protectionism with a tightening of exchange controls, the adoption of Quota 90 and other administrative restrictive measures which led to a definitely autarky regime (Toniolo, 1980)[7].

After WWII, trade policy, appears to be more constrained by the path of international cooperation that Italy has wisely decided to ride. Several plans overlap: the international, the European and the national level[8].

At the international level the return to a monetary order was mainly due to the Bretton Woods agreements, with the establishment of institutions such as the International Monetary Fund and the World Bank. In terms of international trade, the agreements were not able to converge towards the foundation of an institution, but manage to subscribe a "simple" still effective general international agreement the General Agreement on Tariffs and Trade (GATT, however, not very effective up to the Seventies).

At the national level, tariff policy had gradually lost importance in the Fascist era, replaced by other forms of protectionist legislative action (such as the ban on the import and transit of goods supplied by enemies); inflation had also completely watered down specific duties. Between 1947 and 1949, in the absence of effectiveness of the Customs Tariff of 1921, 115 commercial treaties

[6] A General Tariff sets duties approved by the legislative power. The duties of the General Tariff may be revised in the context of bilateral treaties with single States, in which typically the two parties come to a moderation of the duties by reciprocal concessions. These changes give rise to the so-called Conventional Tariff. Cfr. Calderoni (1961).
[7] See also A'Hearn and Venables (2013) and Fauri (1996) for accurate calculations.
[8] For a general account, see Crafts and Magnani (2013).

were concluded, initially based on reciprocity and private compensations. In July 1950 a new Tariff was approved. It introduced *ad valorem* duties and was still characterized by a high level of protection for certain products (wheat, sugar, wine and spirits, yarns and textiles, electrical equipments, automobiles and tractors).

During the Fifties, a fundamental role in shaping the levels of protection was carried out by the Organization for Economic European Cooperation (OEEC), a body which, under the European Recovery Plan, played a decisive role in promoting trade and especially in the process of liberalization of trade through the removal of quantitative restrictions. Through the Union European Payments Union, OEEC provided also a solution to the problem of bilateral payments under currency inconvertibility[9]

Crucial for Italian protection were obviously the European treaties signed in the fifties, in particular the European Coal and Steel Community (establishing a preferential customs house for coal and steel products) and the Treaty Rome in 1957, establishing the European Common Market. ECM aimed at the complete removal of intra-EEC duties (with a transitional regime 12 years) and at the regulation EEC protection with respect to third countries with a common external tariff (Pierucci and Ulizzi, 1973). The Customs Union established in 1958 was is in fact conceived as a gradual process of tariff reduction and harmonization within and outside the EEC. Referring only to industrial products within-EEC duties came to a complete suppression only in July 1968 when member Countries also converged to a single common customs tariff[10].

The reduction of tariff barriers, however, was accompanied, after the oil shock of 1973 and the subsequent global recession in 1974-75, by the rising of non-tariff barriers such as quantitative restrictions on imports (import quotas), administrative controls. The intensity 'of these measures was such as to lead some authors to wonder if he had entered a phase of neo-protectionism (Grilli, 1984).

The period that goes from the mid-Seventies to the end of the XX Century is marked by a plethora of facts, often overlapping, starting from the important Multifiber Arrangements that "governed the world trade in textiles and garments from 1974 through 2004, imposing quotas on the amount developing countries could export to developed countries" (it was completely abandoned only in 2005). In this period, Common European trade policy (at the regional level) and Gatt/WTo

[9] The European Payment Union operated for eight years from September 1950, with the aim of ensuring the de facto convertibility of the currencies of the countries of OEEC and those in the Sterling area, within a framework of multilateral compensation that allowed overcoming the impediments linked to currency inconvertibility. Martinez Oliva and Stefani (2003).

[10] Trade relationships with non-EEC countries was ruled by a Common Tariff. The Treaty of Rome stated that the Common Tariff was actually a starting point for subsequent negotiations with third countries. The duties of this Common Tariff were initially set as the arithmetic average of those duties in force in the four member territories in January 1957. See Pierucci and Ulizzi (1973).

negotiations drive the evolution of trade policy stance. In spite of progressive tariff reductions fueled by the Tokyo Round (1973-1979), also the Eighties witnessed an increase in non-tariff protection, accompanied by measures to support the production and exports. The Gatt/WTO effectiveness in promoting multilateralism is still heavily questioned, with apparent inability that showed to ensure free international trade, with is inability to extend the its rules to important areas of world trade (such as textile and clothing industries and agriculture) and unable to stem a tendency to regionalism (see for example, Rose, 2004; Subramanian, Wei 2007. Se contra, Irwin ??).

(Say something about RTA, regional trade agreements, new protectionism alerts)

3. Gauging the obstacles to international trade: a measure of the trade costs[11]

In a Journal of Economic Literature paper published in 2004, James Anderson and Eric van Wincoop mark the state of the knowledge as far as trade obstacles are concerned, stressing on the enormous difficulties faced in obtaining accurate measures of trade costs: "Particularly egregious is the paucity of good data on policy barriers" (p. 693). Many direct trade costs, such as those associated with information barriers and contract enforcement, but even transport costs can hardly be directly measured; many trade cost components are definitely unobservable.

Direct evidence on trade costs comes in two major categories, costs imposed by policy (tariffs, quotas and the like) and costs imposed by the environment (transportation, insurance against various hazards, time costs). They could be really a lot: David, 2004 surveys 70 measures. Thus direct measures of trade costs turn out to be "remarkably sparse and inaccurate". What emerges clearly is that duties alone can be a poor indicator of trade restrictiveness as non-tariff barriers also provide a considerable degree of trade protection.

A "popular" (Oliva and Rivera-Batiz, 2003, p. 412) but definitely very crude and aggregate direct measure of the level of protection (it is a useful overall measure but it can disguise, on one side very high protection levels in some sectors, on the other, a higher level of overall protection that actually depends only on a small number of goods[12]) can be easily computed as the ratio of revenues from import duties over the value of imports[13]. If computed for Italy what we get is shown in Figure 2. From 1870 until the early Nineties the average protection rate (APR) rose from 8 to 18

[11] In this and in the next paragraphs I follow almost *verbatim* the works of Jacks, Meissner and Novy (2008, 2011) and Novy (2013).

[12] On the first point, James and O'Rourke (2013) show that by 1913 wheat tariffs in Italy in 1913 were equivalent to a roughly 40% ad valorem tariff. A'Hearn and Venables, (2013) show that tariff revenues as a share of total import where around 20 per cent at the end of the XIX century. Excluding those revenues on sugar the level drops at 14 per cent.

[13] Federico and Tena (1998), p. 79. The ratio of total tariff revenue to the total value of imports is equivalent to an average of tariff rates with weights proportional to each good's share in total imports.

per cent[14]. At the turn of the century it started falling reaching the 1870 levels just before the outbreak of WWI. In the fascist period, after 1925, protection rose to unprecedented levels (levels which would have no longer reached later). After WWII the average protection started falling after the EEC and, apart from a sudden spike in the early Seventies, it steadily set around 3 per cent. Direct evidence on border costs shows that tariff barriers are now low in most countries, on average (trade-weighted or arithmetic) less than 5 percent for rich countries, and with a few exceptions are on average between 10 percent and 20 percent for developing countries[15].

Lately, an indirect approach to measure trade costs has been developed and has produced a measure of aggregate bilateral trade costs that is consistent with leading theories of international trade. The logic behind this method is to infer the extent of trade impediments from trade flows: it compares actual trade flows to the trade flows predicted by a hypothetical frictionless benchmark scenario based on a micro-founded trade model, attributing the deviation of actual from predicted trade flows to trade frictions (Chen and Novy, The World trade review pag. 401) (from Novy 2009, Gravity Redux: Measuring International Trade Costs with Panel Data). This approach allows us to capture the combined magnitude of tariffs, transport costs, and all other macroeconomic frictions that impede international market integration but which are inherently difficult to observe.

The trade cost measure is based on the gravity equation framework developed by Anderson and van Wincoop (2003)[16]. Since this trade cost measure is a function of observable trade data, it can be easily implemented with time series and panel data to track the changes of trade costs over time. It represents **an average of bilateral trade barriers** and reflects a **great variety of trade frictions**. It can be interpreted as a gravity residual that compares actual trade flows to those predicted in the absence of all trade frictions.

Anderson and van Wincoop (2003) derive a micro-founded gravity equation with trade costs:

$$x_{ij} = (y_i y_j / y^w) \, (t_{ij} / \Pi_i P_j)^{(1-\sigma)}$$

where x_{ij} denotes nominal exports from i to j, y_i is nominal income of country i and y^w is world income defined as $y^w = \Sigma_j y_j$. Bilateral trade costs are t_{ij} and $\sigma > 1$ is the elasticity of substitution across goods. Π_i and P_j are country i's and country j's multilateral resistance variables. Trade between two regions depends on the bilateral barriers between them, relative to average trade barriers that both regions face with all their trading partners.

[14] Bairoch's data suggest that in 1913, the Italian average tariff was 9.7%.

[15] Hummels (2007),shows that average U.S. import tariffs dropped from 6.0 to 1.5 percent since 1950, and worldwide average import tariffs dropped from 8.6 to 3.2 percent between 1960 and 1995 (see also Clemens and Williamson, 2002).

[16] In their highly influential paper, Anderson and van Wincoop (2003) demonstrate that are not only bilateral trade barriers but also multilateral trade barriers that determine the trade flows between two countries.

The gravity equation implies that all else being equal, bigger countries trade more with each other. Bilateral trade costs t_{ij} decrease bilateral trade but they have to be measured against the price indices Π_i and P_j. These price indices have been called multilateral resistance variables because they include trade costs with all other partners and can be interpreted as average trade costs (they are a sort of weighted average of all bilateral costs a country faces in trading with all other countries. So, what matters is the relative trade barrier.

Following Novy (2009), starting from Anderson and van Wincoop (2003) gravity formula we can get to the following equation:

$$T_{ij} = (t_{ij}t_{ji}/t_{ii}t_{jj})^{1/2} - 1 = (x_{ii}x_{jj}/x_{ij}x_{ji})^{[1/2(\sigma-1)]} - 1 \qquad (1)$$

The intuition behind T_{ij} is straightforward: the more a country trades with itself, the higher must be the trade barriers it faces on international markets. If bilateral trade flows $x_{ij}x_{ji}$ increase relative to domestic trade flows $x_{ii}x_{jj}$, it must have become easier or convenient for the two countries to trade with each other. This is captured by a decrease in T_{ij}, and vice versa. The measure thus captures trade costs in an indirect way by inferring them from observable trade flows. Since these trade flows vary over time, trade costs can be computed not only for cross-sectional data but also for time series and panel data.

(They can also be interpreted as an *implied markup on retail prices of foreign goods*. Thus, we are able to estimate the combined magnitude of tariffs, transportation costs, and all other macroeconomic frictions that impede international trade but that are inherently difficult to observe). I use this measure to examine the growth of Italy's bilateral trade between 1870 and 1913, its retreat from 1921 to 1939, and its subsequent rise from 1950 to 2000.[17]

Figure 3 present the results. Overall, between 1870 and the early Nineties the trade costs measure shows a sensible decrease, dropping from a tariff-equivalent value of 170 to 138 per cent, a 23 per cent decrease[18]. The overall measure of trade costs experienced a marked decrease in the

[17] The data used are from Jacks, Meissner and Novy (2008), available from David Jacks web page: http://www.sfu.ca/~djacks/data/publications/index.html. They are from different sources and use mainly Mitchell, B. R. 2003c. International Historical Statistics New York: Palgrave Macmillan for trade data. The expression for trade costs requires domestic trade data, x_{ii} that have to be constructed. As done by other authors (Anderson and van Wincoop, 2003, Jacks, Meissner and Novy, 2011), we use GDP data and not gross output. There are two possible problems. The first, is that GDP is based on value added where trade data would require to use gross output. Since the latter is by construction higher than GDP (it includes intermediate inputs) using GDP could leas to an underestimation of domestic trade (computed as y_i-x_i) of our trade costs and hence of trade costs. The second problem stem from the inclusion of services in GDP, that could determine an overestimation of domestic demand and of the trade cost measure, especially in most recent periods.

[18] Trade costs have been found large and variable. Anderson and van Wincoop (2004) find that a rough estimate of the tax equivalent of "representative" trade costs for industrialized countries is 170 percent. This number breaks down in 55 percent retail and local distribution costs (market access), and 74 per cent international trade costs (1.7=1.74*1.55-1).

first decade of the period considered. This reduction stopss in the early Eighties of the XIX Century. A slightly decreasing although variable path follows until the WWI. In the interwar period our measure of trade costs rises to unprecedented levels. After WWII we assist to the huge drop in trade costs that lasted until the second half of the Seventies when this rapid decrease stops and it is followed by a period of relative stability[19].

In a first phase from 1870 to the WWI outbreak the level of trade costs underwent a 24 per cent drop, due in particular to a sensible fall between 1870 and the early Nineties (-16,8 per cent) followed by a milder still consistent decrease in the following period (- 7.7 per cent). After WWI our measure of trade costs decreased by 5,2 per cent. Then, the index rose steadily (until 22,5 per cent) the eve of WWII. From 1950 to 1973 the overall obstacles to bilateral trade fell by 24,0 per cent while in the 1973-1998 period the index decrease by 6,0 per cent.

With respect too single partners, the important fall in trade costs registered in the very first period seems to be mainly due to the reduction of bilateral costs with Germany and Belgium. The trade costs with respect to France had a sharp increase in 1887, (trade war with France): they had a 16 per cent jump with respect to France and determined a 3.1 per cent increase in the overall measure of trade costs. Bilateral costs with Switzerland show a flat path. The trajectory of US trade costs could account for the overall decrease in transport costs (O'Rourke, and. Williamson. 1999), while costs with the UK did not have any sensible variation in the pre WWI period while decreased constantly after WWII.

4. Determinants and contribution of trade costs to the growth of bilateral trade

What can we say about trade costs?

First, we check their consistency with some direct measures. Second, we perform a decomposition of bilateral trade flows and see how trade costs accounted for this decomposition.

In order to understand whether the trade cost measure is related to common trade cost proxies from the gravity literature, I have run a panel regression following JMN (2008) and I tried to infer

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The 74 international trade costs can be divided in a 21 percent transport cost (includes both directly measured freight costs and a 9-percent tax equivalent of the time value of goods in transit) and a 44 per cent border-related costs (0.74=1.21*1.44-1). A rough breakdown of the 44 percent border costs is as follows: 8 percent policy barrier (including non-tariff barriers); 7 percent language barrier, 14 percent currency barriers a 6 percent information cost barrier, and a 3 percent security barrier for rich countries. “Inferred border costs appear on average to dwarf the effect of tariff and nontariff policy barriers”: Anderson and van Wincoop (2004), p. 693.

[19] Some neat differences emerge with respect to the rough tariff measure mentioned previously. In terms of tariff equivalent levels, tariffs seem to account for a very small portion of total trade costs. In terms of behaviour, one can argue that in the late XIX Century the reduction in non-tariffs related barriers more than compensated the increase in average tariffs, while in the Fifties the well known reduction in the quantitative restrictions imposed by the OECE within the liberalization induced a reduction of the obstacles to trade notwithstanding a rise in the nominal tariff protection.

on the impact of distance and tariff policy on trade costs estimating the bilateral trade costs measure using our panel of 13 countries. I do not intend to give a causal interpretation to these results, although using the panel structure and controlling for time and country fixed effects we obtain clean correlations. In particular, I use a standard trade costs function:

$$Tij = f(X_{ij}, X_j, X_i, v_{ij}) \qquad (2)$$

The trade costs faced in shipping a good from country *i* to country *j* are a function *f* of cost factors that are specific to the importer or the exporter, X_i and X_j respectively (that could be related to infrastructures, institutional setups, geographical features as land locking), to bilateral cost factors related to the actual journey from *i* to *j* and vice-versa (such transport costs, tariffs, or sharing a common border, language barriers, membership of a free trade union) and to other unobservable factors. Given the lack of transport costs data between a sufficient number of countries, these are proxied with bilateral distance (van Bergeijk and Brakman, ???). The trade cost function is usually estimated as a log linearized form of the following:

$$T_{ijt} = \prod_{m=1}^{M} X_{mijt}^{\alpha_m} [\exp(\beta_0 + \beta_1 \nu_{ij} + \beta_2 \mu_j + \beta_3 \gamma_t + \beta_4 \theta_{ijt} + \varepsilon_{ij}] \qquad (3)$$

where X_{mij} are the *m* bilateral obstacles considered, ν_{ij} are country-pair dummies related for example to membership of a free trade union, μ_j and are time invariant country *j* fixed effects, γ_t are year fixed effects and θ_{ijt} are interaction terms country*decade.

In our case, the log-linearized formula takes this form:

$$ln(T_{ijt}) = \beta_0 + \alpha_1 ln(Dist_{ij}) + \alpha_2 ln(Tar_{it}) + \alpha_3 ln(Tar_{jt}) + \alpha_2 lnExr_{ijt} + \qquad (4)$$
$$+ \beta_1 \nu_{ij} + \beta_2 \mu_j + \beta_3 \gamma_t + \beta_4 Int + \varepsilon_{ij}$$

Potential determinants include policy and geographical variables. In particular, the variables considered are the logarithm of distance between two countries (*Dist*); a measure of tariff protection proxied by the log of each country ratio of customs revenues to total imports; the bilateral nominal exchange rate volatility (*Exr*); an indicator variable whether the two countries had a custom union (namely the EEC: ν_{ij}). The panel data structure allows controlling for time-invariant characteristics of single countries, for year fixed effects and for time variant trends specific to each country (interaction country*decade).

Results are reported in Table 1. Domestic protection, as proxied by the average tariff rate is positively associated with higher trade costs although weakly correlated. With respect to column 3, over the whole period a 10 per cent increase in the degree of domestic protection led to an increase of roughly 0.5 per cent in trade costs. This means that doubling the tariff rate would have determined roughly a 5 per cent increase in trade costs (in terms of standard deviations, a one standard deviation increase in the log of the average tariff would have yielded a 0.12 standard deviations increase in the log of trade costs).

Foreign tariffs had a higher impact. A 10 per cent increase in the degree of foreign protection led to an increase of roughly 1 per cent in trade costs. Doubling the rate of foreign tariffs would mean roughly a 10 per cent increase in trade costs. In terms of standard deviations, a one standard deviation increase in the log of the foreign average tariff would yield a 0.23 standard deviations increase in the log of trade costs.

Looking at different sub-periods, before WWI the effects of domestic tariff protection is not significant (this echoes many interpretations reviewed in section 1) while foreign tariffs had a higher impact (a one standard deviation increase in foreign tariffs increased the trade cost measure by a third of a standard deviation); it is more incisive on the rise of trade costs in the interwar period when one standard deviation increase in the log of the domestic average tariff would yield a 0.20 standard deviations increase in the log of trade costs. In the post-WWII period domestic tariffs seems to have had a higher impact: an increase in one standard deviation in tariffs would have raised trade costs by 0.4 standard deviations.

Distance is definitely relevant in shaping trade costs. Over the whole period, a one standard deviation increase in the log of distance raises the log of trade costs by 0.26 of a standard deviation. In terms of actual distance, on average our estimates tell that 1000 km more in distance cause a 40 per cent increase in trade costs[20]. Coefficients on distance slightly decrease over time although the contribution of distance to the full explanation of trade costs is non monotonic. In the interwar period it seems to explain more of the change in trade costs (0.31 standard deviation increase in trade costs related to a one standard deviation increase in distance) while in the other two period the change in trade costs have a weaker influence (0.17 and 0.19 in pre-WWI and post WWII respectively).

[20] These values are in line with others' findings. Jacks, Meissner and Novy (2008) and (2009), find that a one-standard-deviation rise in distance raises trade costs by 0.40 standard deviations, while an equivalent increase in tariffs is associated with a trade costs rise of 0.42 standard deviations. In Eaton and Kortum (2002), a paper related to the US in the Nineties of the XX Century, raising distance from 750 to 1500 miles implies a trade cost rise of 34 per cent.

According to the results obtained, exchange rate volatility, as a factor raising uncertainty, did not affected the costs of trade (gold standard dummy is still missing, and a dummy for bilateral treaties too), while the EEC membership had a huge impact on trade costs: controlling for distance and tariff protection, trading with EEC partners was 20 per cent less costly than trading with non-EEC countries. Last, trading with border countries (the border variable is used in alternative with respect to distance: other coefficients showed robust to this change) cuts trade costs of a half in the full sample and even more than a half in the 'first globalization' period.

As said, these results do not pretend to have a causal interpretation of the relationships, but can at least be considered pretty clean correlations. They show that standard factors that are known to be frictions in international trade are sensibly related to the trade cost measure.

So far we have dealt with the measures of the obstacles to international competition and their possible determinants. Now we turn into a questions more strictly related to our goal of measuring the effects of trade obstacles. Thus, we ask: how the reduction (increase) in trade barriers affected the increase (reduction) of trade flows? We resort to a decomposition of trade flows in order to examine the contribution of these obstacles to the growth of bilateral trade flows in the Italian economic history.

The decomposition adopted is coherent with many micro-foundations of the gravity equation (Eaton and Kortum, 2002; Melitz and Ottaviano, 2008). After some manipulation, the standard gravity equation we have seen in the previous paragraph can be re-written as:

$$\Delta \ln(x_{ij} x_{ji}) = 2\Delta \ln\left(\frac{y_i y_j}{y^W}\right) + 2(1-\sigma)\Delta \ln(1+\tau_{ij}) + \Delta \ln\left(\Pi_i P_j\right) \qquad (5)$$

This equation decomposes the growth of bilateral trade into three components (Jacks, Meissner and Novy, 2011; Novy, 2013). The first term on the right-hand side represents the proportionality between outputs growth and bilateral trade growth. The second term reflects the contribution of reductions in trade costs, as measured by τ_{ij}, to the growth of bilateral trade. The last term represents changes in multilateral factors and its precise interpretation depends on the underlying trade model: we refer to it as a measure of trade diversion[21].

[21] In Anderson and van Wincoop (2003), Eaton and Kortum (2002), and Chaney (2008) this can be interpreted as a trade diversion effect (if multilateral trade barriers fall over time, the ratio of domestic trade to output goes down so that the contribution of the third term to bilateral trade growth becomes negative). In the Melitz and Ottaviano (2008) model, the last term would capture changes in the degree of competition in a country as indicated by the number of entrants and the marginal cost cut-offs above which domestic firms decide not to produce. The intuition is that tougher competition in country j, reflected by a lower marginal cost cut-off, makes it harder for exporters from i to break into that market. So country i redirects its exports toward a different market.

Results are reported in Figures 4-6 and in Tables 3 and 4. Over the whole period the Italian bilateral trade with the thirteen partners considered raised eleven times. More than 60 per cent of the total growth can be ascribed to the proportionality factor, due to the "mass" effect. The attenuation of barriers to international competition accounted for 40 per cent of this total growth. Figures change across different periods. In the "first globalization" period the mitigation of international barriers accounted for more than a half of the increase in bilateral trade flows, more than GDPs, while in post WWII the contribution of costs and GDPs is rather equal. The interwar period is an outlier, as usual. Had trade barriers in that period not been raised, the growth in bilateral trade would have been of 90 per cent (instead of ??). Trade costs behaviour thus, account for the entire fall in trade over this period. Multilateral/trade diversion patterns do not emerge as incisive at least in this aggregate analysis.

If we look at the same decomposition with respect to each country/period, between 1870 and 1913 the overall reduction in trade costs had a deep impact on the growth of overseas trade (US and Canada) and on European trade with Belgium, Germany and The Nederland, while it did not affect commercial relationships with UK and Switzerland (that benefited also of some trade diversion) A particular case (and not only in this sub-period) is represented by France. We already stressed on the commercial war between France and Italy that caused bilateral trade costs rising roughly 16 per cent in 1887 and overall trade costs rising 3 per cent. Depending only on trade costs behaviour, the bilateral trade between the two countries would have reduced by 44 per cent in the period.

In the interwar period trade costs dominated GDPs in shaping the growth of trade. In almost all countries (except Greece, Switzerland and Austria) our measure of trade costs gave a decisive contribution to the reduction of the trade flows. Moving to the most recent period, the picture is more balanced, with trade costs contributing roughly a half of the post WWII period trade growth. These figures are also reported by single countries (Table ?? and Figure ??). On average, in Austria, France, Switzerland, the UK and the US, trade costs behaviour explained less than one third of the overall bilateral trade growth.

As a whole, partial conclusions for this section are the following. Trade costs are high. In tariff equivalent terms, they amounted to 130 per cent on average in Italy over the long run. They contributed to roughly the two fifths of the total growth in bilateral trade. Figures vary across space and time. The contribution of their change was decisive in the post WWII period; definitely important in the first pre-WWI phase and undoubtedly crucial in determining the reduction in bilateral trade in the interwar period.

5. The welfare gains from international competition: a counterfactual analysis.

So far we have analysed the limits to bilateral trade: we calculated indexes, investigated their correlation with classical obstacles and their contribution to the growth of bilateral trade at large. Now we try to answer the following research question: what can we say about the effects of international competition on the Italian economy?

As said in the introduction, the issue of international competition gained momentum recently. Mainly one reason lies at the heart of this renewed attention: globalization, with the access of BRICs countries to the international arena with the resulting fear of an invasion of goods produced in this emerging economies, developing fast but still low-wage.

In analysing the issue, economic research benefited of a vast amount of data collected at the firm/plant level. But it also benefited of what can be considered the most important theoretical innovation that the field of Economics has faced in the last fifteen years, namely, the new microeconomic models of international trade inaugurated by J. Eaton and S. Kortum (2002) and M. Melitz (2003) seminal contributions. These models gave formal representation (and thus opened to new empirical analysis) to firms' responses to the increased openness, by explicitly and formally considering firms heterogeneity[22].

Along these lines, long run historical analyses are extremely difficult due to the lack of disaggregated data. Nonetheless, there is a growing body of literature that can help economic historians to partially overcome such difficulties. The present is the first study, as far as I know, that tries to use this brand new literature to give a measure of the effects of international competition in history. The literature I refer to, aims at giving well micro-founded but indeed very simple computable measures of the Gains from Trade (henceforth, GfT) induced by foreign competition, that can be returned as an ideal counterfactual.

Feenstra (2014), identifies three main possible source of GfT arising from an increased foreign competition in recent monopolistic competition models:

(i) New import varieties available to consumers.

This is a classical source of gains (see Krugman, 1980; Broda and Weinstein, 2006[23]). In the monopolistic competition literature with heterogeneous firms, attention has nonetheless shifted to the production side of the economy where increased openness is widely believed to induce

[22] As we will see shortly after, in this model the mechanism that lies behind the response of firms to an increase of foreign competition, is the selection effects: trade liberalization causes the least productive firms to exit and leads to a reallocation of resources towards more productive firms.

[23] Broda and Weinstein (2006) measured recently these gains from trade for the U.S. Aggregating over a range of goods, they obtain an estimate of the gains from trade for the US due to the expansion of import varieties, which amount to 2.6% of GDP in 2001.

competitive effects. Using the words of Chen, Inbs and Scott (2009, p. 50), "*in response to greater foreign competition and increased imports, profit margins should fall as mark-ups and prices decline, and average productivity should increase as marginal firms exit*".

Thus, possible supplementary sources of GfT emerge:

(ii) Reduced mark-ups and prices charged by firms due to import competition (as in Melitz and Ottaviano, 2008). This is what has been called the *pro-competitive* effect of trade[24].

(iii) Higher productivity due to selection and reallocation of firms and workers (Melitz, 2003, Bolatto and Sbracia, 2014). More productive firms begin exporting and less productive firms exit the market Firms heterogeneity should, then, lead to a further source of gains from selection, due to of more efficient firms into export markets, via reallocation of firms and workers. This drives out less efficient firms and therefore raises average productivity[25].

Furthermore, Sampson (2013) identifies a supplementary channel arising from competition:

(iv) dynamic gains: firms heterogeneity increases the gains from trade not only due to reallocation but also because of technology spillovers from incumbent firms to entrants that ends in higher average productivity over time as competition becomes tougher.

Notwithstanding these microeconomic channels are theoretically well identified, in our macro approach the question at stake is: does firm level heterogeneity really matter for the aggregate gains from trade?

In a very influential paper Arkolakis, Costinot, and Rodriguez-Clare (2012) make the following statement (p.94): *to what extent new micro-level questions have affected the answers to an old and central question in the field: how large are the welfare gains from trade? A crude summary of our results is:* ***"So far, not much."***

The main argument of their work is that, independently from micro-level implications (*regardless of the actual margins of change*), the general welfare predictions (of an important class of trade models) depend on only two sufficient statistics: (i) the share of expenditure on domestic

[24] Bugamelli, Fabiani and Sette (2010) estimates pro-competitive effects of Chinese competition for Italy. They find that (p.5) the "increases in the share of Chinese products in total Italian imports have a negative causal impact on firms' price dynamics. This result is obtained estimating a reduced-form model of firm-level pricing that accounts for demand and cost shocks, for domestic competition and import penetration, for firms size and productivity and for time and sector effects. The size of the impact of the Chinese import share is non-negligible: firms operating in a sector where such a share is 10 per cent higher tend to contain their output price growth by 0.3-0.4 percentage points per year.

[25] Firms selection was analysed in many works. Trefler (2004) for Canada, showed that the exit of less-efficient firms led to a substantial increase in average industry productivity following the Canada-U.S. free trade agreement. See also Pavcnik, 2002 for Chile).

goods, λ (which is equal to one minus the import penetration ratio[26]); and (ii) the elasticity of imports with respect to variable trade costs, ε, called "trade elasticity" (partial derivative of the coefficient on trade costs in a gravity-like estimation of bilateral trade flows: it drives the "love of variety" parameter).

Before getting to the critics that this provocative statement raised, I now turn to the computation of the welfare gains by using the simple formula they proposed: it allows to perform a counterfactual analysis[27] that shows, in real GDP metrics, the loss Italy would have had in autarky.

Afterwards, I'll show how competing approaches could modify our results.

The statistics used to compute the welfare gains is the following (Arkolakis, Costinot, Rodriguez-Clare, 2012; Costinot and Rodriguez-Clare, 2013; Arkolakis, Costinot and Donaldson, 2012):

$$\dot{W}_j = \dot{\lambda}_j^{-\frac{1}{\varepsilon}} \qquad (6)$$

where dots mean percentage changes.

Welfare changes in country j can be computed weighting the import penetration ratio with the trade elasticities[28]. It corresponds to the compensating variation in GDP associated with a foreign shock. Namely, percentage changes in real welfare can be expressed as the percentage change in income that the representative agent would be willing to accept in lieu of the shock to happen.

In the case the shock consists in moving to autarky, we define G_j as[29]:

$$G_j = 1 - \lambda_j^{\frac{1}{\varepsilon}} \qquad (7)$$

Although this formula is unable to catch the *pro-competitive effects of trade* (it is derived using CES preferences that have constant elasticities of substitution, hence mark-ups are constant), the authors claim this formula is able to consider welfare gains stemming from the selection effects. Nonetheless, in this macro approach, the selection effect does not change the aggregate welfare gains since the exit of firms with lower productivities generate a reduction in domestic varieties (see

[26] Import penetration ratios are defined (OECD definition) as the ratio between the value of imports as a percentage of total domestic demand. The import penetration rate shows to what degree domestic demand D is satisfied by imports M. It is calculated as M/D, where the domestic demand is the GDP minus exports plus imports i.e. [D = GDP-X+M)].

[27] "*Although quantitative trade models are now able to explain a wider set of micro-level facts, they can still be used for counterfactual analysis using a very limited amount of macro data*" (Arkolakis, Costinot, Rodriguez-Clare, 2012, p. 119).

[28] Note that import penetration ratio is defined as the share of internal demand satisfied by imports. So, in this computation what we are focusing on is only the contribution of openness in terms of foreign product competition and, possibly, also in terms of the productivity increase due to selection, not to export itself (via for example learning by exporting).

[29] This simple formula, that I'll use to compute a counterfactual of Italian real GDP as if Italy were in autarky, is, once again, based on two "sufficient statistics" (trade shares and trade elasticities) can be derived from a wide class of models (Melitz, 2003, Eaton and Kortum, 2002).

Arkolakis, Demidova, Klenow and Rodriguez-Clare, 2008; Tybout, 2003[30]) that affects negatively welfare and completely offset the gains stemming from the increase imported varieties (other authors do not agree with this interpretation[31]). At the very least, this formula is in any case able to consider the more varieties channel and in this sense I consider the results a lower bound.

Before turning to computation we must address the issue of the elasticities. Trade elasticities have been estimated in a great number of works, for many countries and for different historical phases. Until recently their values were found in the [5,10] interval, with a median of 8. (See Anderson and van Wincoop, 2004). Actually, the most updated estimates return much lower values (in the range 3 to 5).

Obviously, taking the average of the values found in literature and keeping this elasticity constant over time is a crude approximation. Thus, we estimated time-varying Italy-specific trade elasticities[32].

The trade elasticity has been estimated via gravity equation (see Appendix A.2). To obtain a benchmark value, the estimation was initially performed over the entire sample for every country pair, delivering a value for the trade elasticity equal to 4.02. The pooled regression was then restricted to the subsample of country pairs where Italy was the importer and this approach produced an estimated trade elasticity of 3.89, which is encouragingly in line with the overall measure (see Table 1 below).

Subsequently, the analysis tried to capture the likely time-varying nature of the parameter of interest, putting into place three different strategies in this respect: decadal estimation, structural break testing and historical periodization (Appendix A.2 for details).

[30] From Arkoloakis Demidova Klenow, (2008), p.444 "An increase in import competition would cause a decline in domestic variety as domestic firms exit. In fact, the evidence does suggest that trade liberalization leads to exit by domestic firms (James Tybout 2003). Consistent with this, domestic variety is endogenous in most recent models and falls with a decline in trade costs".

[31] Melitz and Redding (2013) argue that ACR formula is not able to consider the benefits arising from the average productivity increase due to selection an reallocation of market shares. They compute the gains from trade that allegedly consider an extra effect on welfare due to selection.

[32] We computed gains from trade using a constant elasticity $\varepsilon = 8$.In this case, the average compensating variation in terms of real income that a representative consumer should have to be compensated for the welfare losses induced by autarky would amount on average to 1.5 per cent a year from 1870 to the end of the Century. Then, welfare losses rapidly rose reaching 2 per cent before the WWI outbreak. Just after the Great War, and until the Fascist protectionist turn in 1925, welfare losses peaked to 3 per cent. Protectionism in the interwar period reduced the hypothetical compensation one would require to move into autarky (since Italy was already close to autarky, so the contribution of foreign good was very low). After WWII we assist to a prolonged rise of welfare gains from trade that rose from less than 1 percentage point to 4.5 percent (real income equivalent variation) at the end of the XX Century. This path was interrupted only by a reduction in the early Eighties and a subsequent stagnation that lasted until the early Nineties. These numbers are in line with other studies. Arkolakis, Costinot and Rodriguez Clare (2012) using the same formula for the US in 2000, obtained implied gains from trade ranging from 0.7 percent to 1.4 percent (depending on different trade elasticities values). Costinot and Rodriguez-Clare obtain, for Italy in 2000 welfare gains of 2.9 per cent.

The first approach run our gravity equation decade-by-decade, imposing the time span over which the elasticity was supposed to vary to be 10 years long. The analysis produced significant estimates in all the decades considered, with values ranging from 2.77 to 6.60: such a wide range of variation testifies the importance of considering the time dimension of structural parameters when dealing with datasets covering long periods, and the potential bias arising from the use of constant figures in these settings.

As a further improvement, the regression was run over the entire sample adding year dummies D to the equation, so as to detect significant years that could be used to test for the presence of structural breaks. In this way we defined six sub-periods in which to split the 130-year time span and the equation was regressed on each of them, producing values for the trade elasticity ranging from 3.54 to 6.27.

Finally, a similar method was used testing for structural breaks in predetermined dates, building an ad hoc periodization based on supposedly relevant political or economic events. The analysis ended up with 13 relevant historical periods on which to test for structural breaks (which turned out to be all significant according to the Chow test). The range of elasticities obtained is in line with the results from the two previous methodologies (2.36-6.58).

Table 1: Trade Elasticities, various definitions

Decade	Trade Elasticity	Significant Dates	Trade Elasticity	Historic Period	Trade Elasticity	Constant	Trade Elasticity
1870-1879	-3.69			1870-1878	-3.71		
1880-1889	-4.29	1870-1883	-3.54	1879-1887	-4.06		
1890-1899	-5.63			1888-1893	-3.88		
1900-1909	-4.15	1884-1938	-4.65	1894-1913	-4.65		
1910-1919	-5.80			1914-1921	-5.00	Italy	-3.89
1920-1929	-3.30	1939-1954	-6.27	1922-1928	-2.88		
1930-1939	-4.81			1929-1938	-4.73		
1940-1949	-6.60	1955-1964	-4.43	1939-1948	-6.58		
1950-1959	-3.94			1949-1963	-4.38	World	-4.02
1960-1969	-3.20	1965-1989	-3.68	1964-1973	-4.27		
1970-1979	-3.09			1974-1982	-2.83		
1980-1989	-3.19	1989-2000	-2.73	1983-1992	-3.09		
1990-2000	-2.73			1992-2000	-2.36		

Thus, the static gains from trade were computed, again, as gains from moving from autarky to the current level of foreign exposure (equation 7). As mentioned above, these were built as in Arkolakis et al. (2012), with the addition of time-varying elasticities. Given that there was no prior on the best method to compute time-varying trade elasticities among those proposed above, the gains from trade were computed using in turn all the estimates resulting from the three approaches.

The result of this exercise is reported in Figure 7, which also reports gains from trade computed from a constant trade elasticity as a benchmark.

The patterns are roughly similar across different definitions of the trade elasticity: the gains from trade are positive across the entire sample, less than 5 percent per year on average throughout the XIX century. After WWI the constant elasticity GfT takes a slightly different path, failing for example to signal the 1925 peak.

The interwar period is characterized by a fall in the amount of gains that almost reach zero in 1943. Then GfT experienced a steady pattern of increase until the early 1970s, rising from 2.7 to 9.2 in 1974. At the same time the gap between the gains from trade computed with a constant trade elasticity, and those exploiting time-varying elasticities, significantly starts to widen after 1960 (can we say something about product differentiation and goods variety becoming more relevant? Did they played a part?).

Overall, the average value over the entire period amounts to a 4.4 per cent compensating variation in real GDP terms per year. These gains rise to 6.3 after WWII (1950-2000; 8.8 per cent a year between 1973 and 2000) from the 3.6 average of the interwar period (1.7 in the Thirties).

As we have seen before, theory still struggle about the actual sources of the gains that the simple formula we have used is able to consider (only goods variety or also firms selection).

To be on the safe side, we say that for the time being we have computed gains stemming only from variety (Melitz and Redding, 2013 *vis-à-vis* ACR, 2012). But does firms' heterogeneity and competition matter? We tried to exploit the work of Sampson (2013), where he claims that the static gains from trade neglect an important, dynamic channel for welfare improvement, namely the knowledge spillovers effect running from incumbent firms to new entrants and further raising aggregate productivity. Total gains from trade would therefore be the sum of such dynamic gains and the static ones, computed *à la* Arkolakis et al (2012)[33].

It is possible to retrieve these total gains as a nonlinear function of just seven observables: four variables that can be computed for the Italian case (the domestic trade share λ, the new firms creation rate NF, the population growth rate n, the trade elasticity ε) and three parameters (the

[33] Sampson (2013), p.1 : "*Suppose that when new firms are created, innovators can learn from incumbent firms. Then selection on firm productivity not only increases the average productivity of existing firms, but causes knowledge spillovers to new entrants. By strengthening the selection effect, trade generates knowledge spillovers and raises the growth rate. The paper shows that these dynamic gains from trade are not offset by countervailing general equilibrium effects [the decrease in the variety of internally produced goods] and increase the aggregate gains relative to those found in either an equivalent dynamic model with homogeneous firms or the static steady state economies considered by ACRC*"

elasticity of substitution in consumption σ, the elasticity of intertemporal substitution γ, discount rate ρ: see Appendix A.3 and Sampson, 2013, for more details)[34].

Despite some computational issues are still tricky, the analysis we performed relies on the parameter values proposed by Sampson, foregoing an explicit estimation of the parameters which would have required a structural modelling effort that was beyond the scope of the present investigation.

Figures 8 and 9 report the full set of gains from trade (total, dynamic and static), for the various definitions of the trade elasticity. Overall, the results show that the total gains from trade are larger than the static ones and reach values higher than 15 percent of GDP, most notably in the early '20s and at the end of the *golden age*[35]. The average value over the whole period 1870-1980 is 8.2 per cent per year (3.6 points due to static and 4.6 due to dynamic gains).

There is a declining path towards zero gains starting in the late '20s and climaxing around 1945 explained, first, by the fascist explicit autarkic policies enacted after 1928, and then, by the occurrence of WWII. The second part of the Seventies is characterized by a reduction due to non – tariff barriers protectionist policies adopted in that (and in the following) decade. In general, the main turning points in the time evolution of the gains from trade matching with turning points identified in the first part of the work; track GfT carefully and try to say more about their dynamic or and comparison in sub-periods. For example, try to explain why they were so high in the Twenties).

A remarkable feature common to all specifications of trade elasticity is that the dynamic gains account for a large share of the total gains with respect to the static ones, the former always being substantially higher in magnitude (often twice as much) than the latter. The fact that the dynamic component is large highlights also the possible importance of new approaches that consider firms heterogeneity and solve, at least in part, the puzzle represented by the very low values for the gains from trade that previous literature returned so far.

[34] For what concerns parameter choice, Sampson (2013) provides some guidance on how to proceed, suggesting to compute the elasticity of substitution in consumption as, $\sigma = \varepsilon/1.06 + 1$ and to use as values for the elasticities of substitution respectively 0.33 and 0.04 (Garcia-Peñalosa and Turnovski, 2005).

[35] We were able to compute total (static+dynamic) gains from trade only up to 1980.

5. Conclusions

The goal of this work was to give a measure of limits and effects of international competition in Italy in the XX Century. Using bilateral trade data, I computed an index of trade costs that allegedly considers the entire set of obstacles to bilateral international trade. Consistently with other findings, trade costs have been high in Italy: on average, over the whole period of analysis, the tariff-equivalent level of bilateral trade costs amounted to 1.3, (i.e. to 130 percent). This measure differs in space and time, and it is sensibly related to some classical determinants (geographical and policy variables). Moreover, trade costs represented a major limit to trade: I calculated that their reduction accounted for two fifths of the overall bilateral trade increase (more than tenfold) that Italy experimented between 1870 and 2000.

As far as the effects of international competition are concerned, I computed a static and a "dynamic" measure of the gains from trade-induced competition. These measures take into account two of the main sources of welfare gains that emerge in monopolistic competition models: more varieties of goods and firms selection (thus neglecting the likely pro-competitive effect of trade). In computing these gains, the time varying nature of one of the main structural parameters, namely, the trade elasticity, was considered and estimated in three different ways: allowing the trade elasticity to vary by decade; identifying significant time spans through regression analysis; using an ad hoc periodization that follows relevant historic events.

The welfare gains were computed in a counterfactual scenario, and then returned in a GDP metrics quantifying the variation in real income that consumers would require in order to be compensated for the loss of welfare in case of autarky. On average, over 1870-1980, total gains amounted to 8.2 per cent of GDP per year, with important distinctions among periods. Breaking down the gains in their static and dynamic components (the former due to goods variety, the latter due to productivity increases arising from knowledge spillovers between incumbents and entrants), dynamic gains are quantitatively relevant, driving a sizeable share of the variation in total gains. The results show that throughout its history Italy benefited from trade competition with a variable degree of intensity. Nonetheless, according to our computations, competition of foreign goods and firms brought overall significant positive effects that can be quantified in yearly welfare increases up to 15 per cent of real GDP.

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Figure 1. Trade policy on the timeline

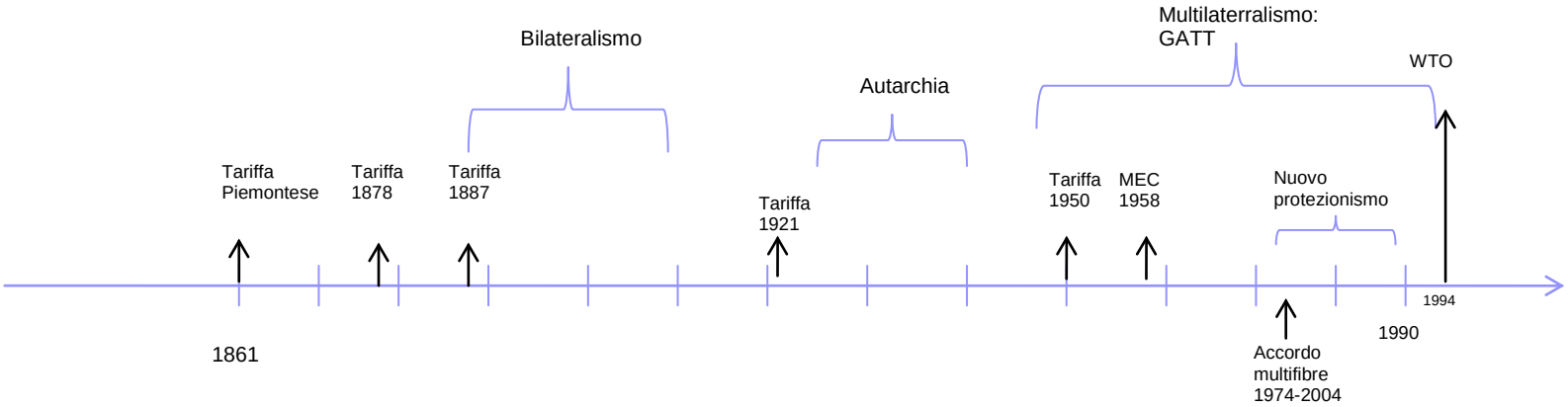
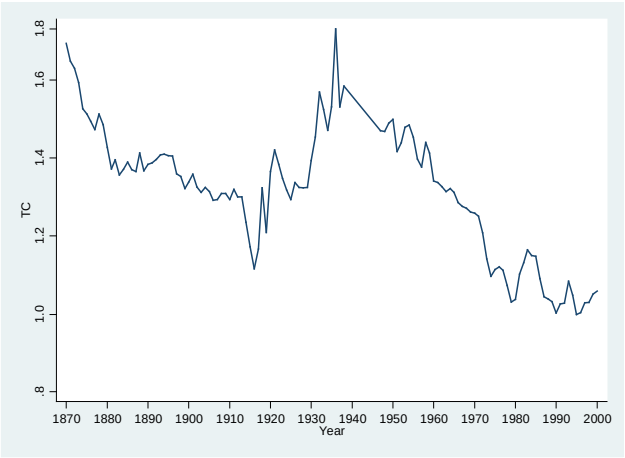
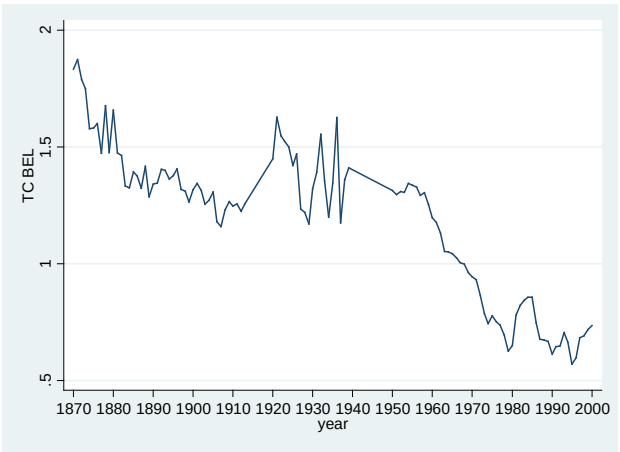


Figure 3. Bilateral trade costs between Italy and selected countries

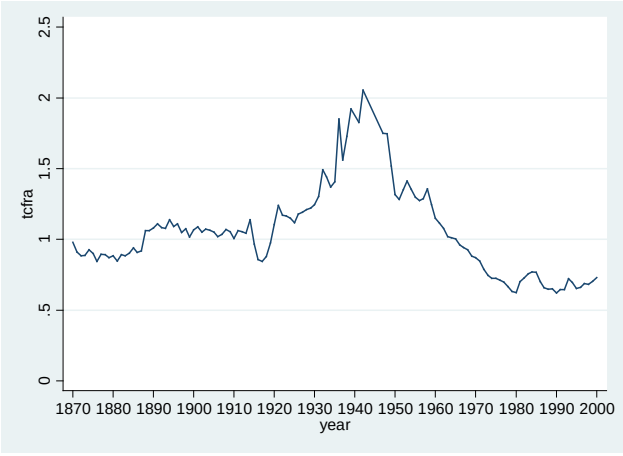
Total



Belgium



France



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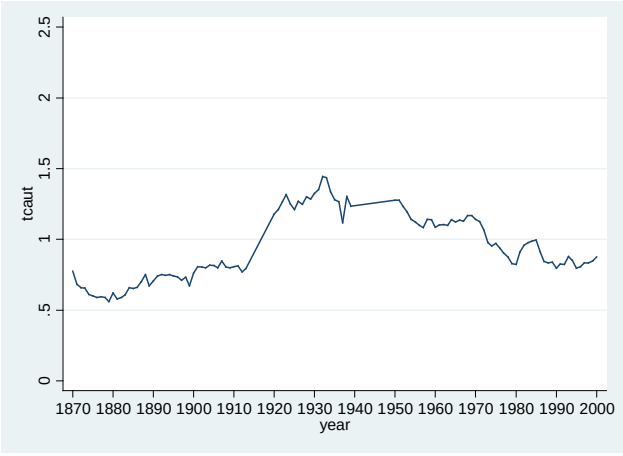
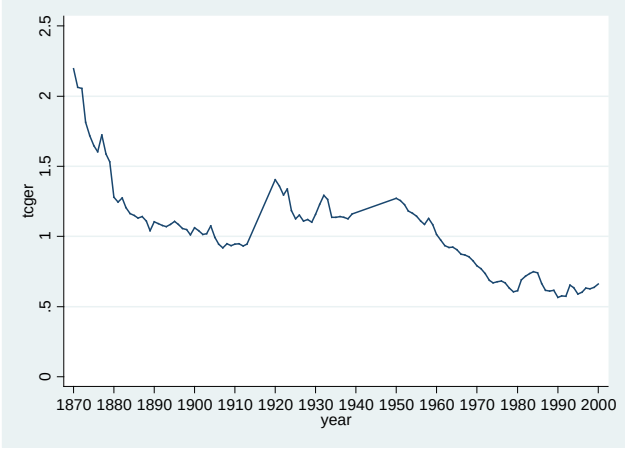
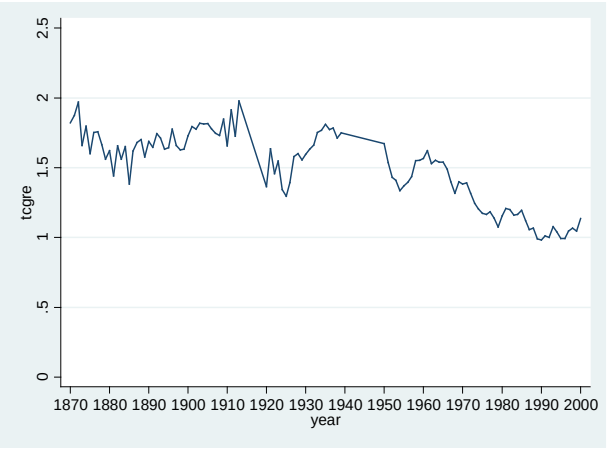


Germany



Greece



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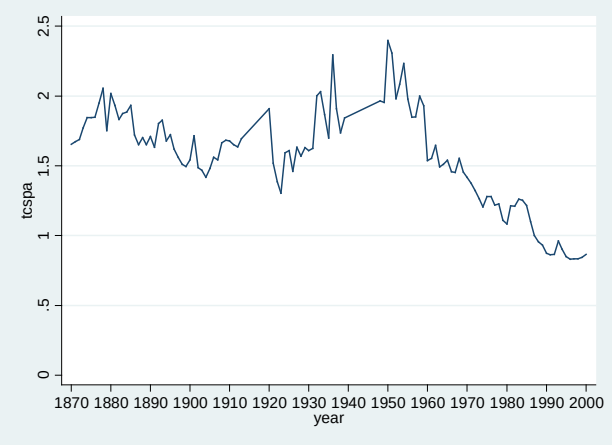
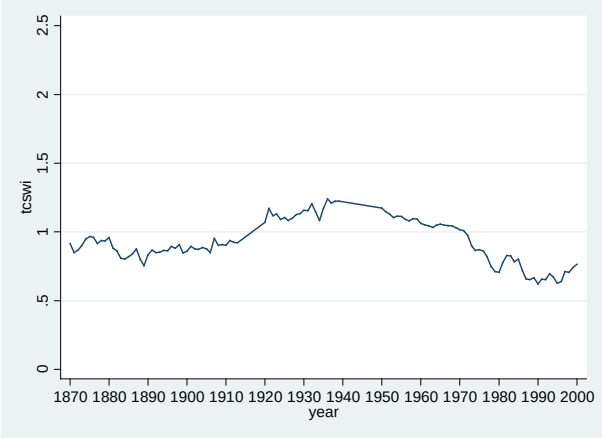
Spain



Switzerland



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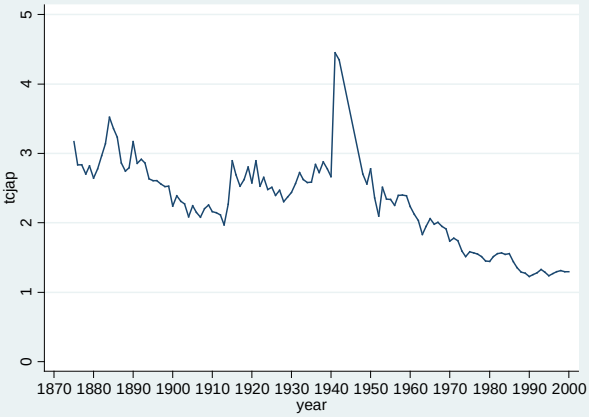
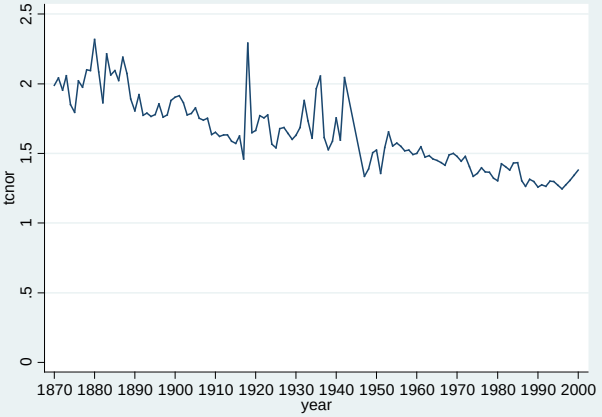
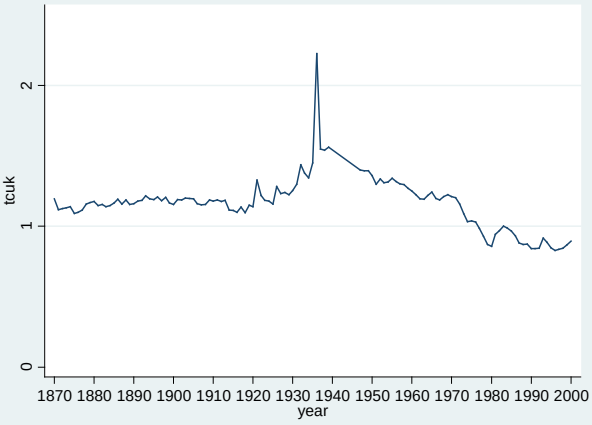


Norway



UK



US

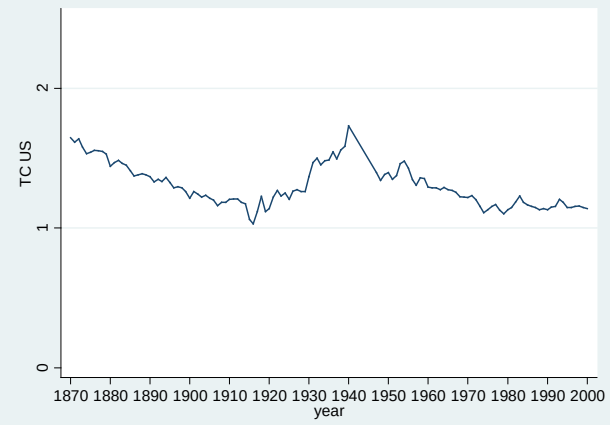


Table 1. Determinants of trade costs

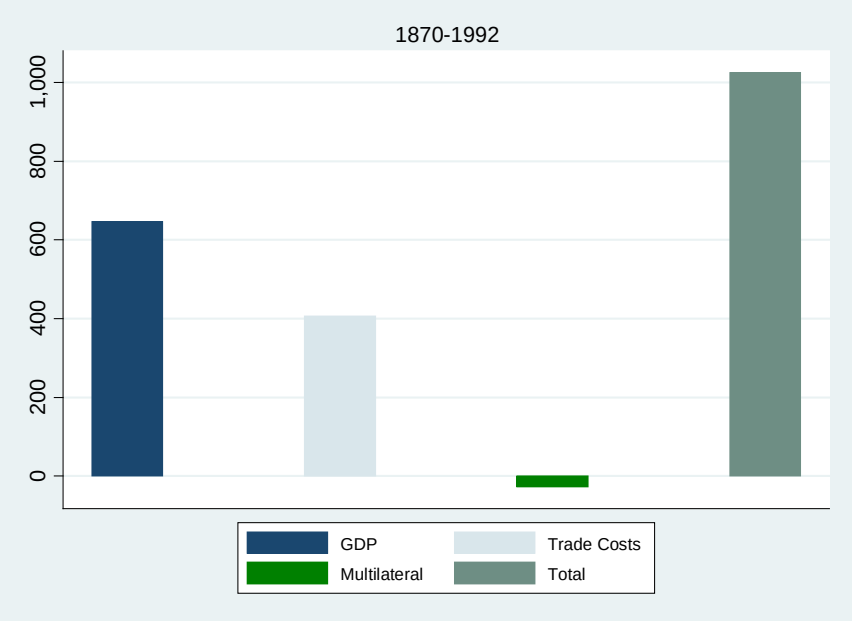
	1870-2000			***Pre-WWI***		
	(1)	*(2)*	*(3)*	*(1)*	*(2)*	*(3)*
Distance	0.19	0.10	0.10	0.30	0.07	0.08
	(0.000)	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*
Exchange rate volatility	0.77	0.06	0.06	0.85	0.12	0.12
	(0.000)	*(0.863)*	*(0.750)*	*(0.609)*	*(0.571)*	*(0.501)*
Tariff home	0.02	0.14	0.04	0.009	0.01	0.02
	(0.000)	*(0.087)*	*(0.005)*	*(0.989)*	*(0.662)*	*(0.399)*
Tariff foreign	0.07	0.09	0.08	0.03	0.12	0.13
	(0.000)	*(0.000)*	*(0.000)*	*(0.546)*	*(0.000)*	*(0.000)*
Border	-0.39	-0.48	-.48	-0.59	-0.53	-0.53
	(0.000)	*(0.000)*	*(0.000)*	*(0.000)*	0.000	0.000
EEC	-	-	-.21	-	-	-
			(0.000)			
Constant	0.92	0.52	-0.24	-1.82	-0.19	-.012
	(0.000)	*(0.381)*	*(0.010)*	*(0.000)*	*(0.000*	*(0.485)*
YEAR FE	NO	YES	YES	NO	YES	YES
COUNTRY FE	NO	YES	YES	NO	YES	YES
COUNTRY*YEAR	NO	NO	YES	NO	NO	YES
R2	0.42	0.79	0.79	0.46	0.95	0.95
N. obs.	1087	1087	1087	464	464	464

	1920-1938			***1950-2000***		
	(1)	*(2)*	*(3)*	*(1)*	*(2)*	*(3)*
Distance	0.10	0.07	0.06	0.14	0.06	0.06
	(0.000)	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*
Exchange rate volatility	0.74	0.01	0.54	0.61	0.25	0.13
	(0.004)	*(0.942)*	*(0.003)*	*(0.200)*	*(0.530)*	*(0.660)*
Tariff home	0.07	0.06	0.04	0.03	0.04	0.08
	(0.000)	*(0.000)*	*(0.010)*	*(0.000)*	*(0.000)*	*(0.000)*
Tariff foreign	0.002	-0.01	-0.01	0.07	0.06	0.06
	(0.896)	*(0.559)*	*(0.851)*	*(0.000)*	*(0.000)*	*(0.000)*
EEC	-	-	-	-0.28	-0.21	-0.20
				(0.000)	*(0.000)*	*(0.000)*
Border	-0.19	-0.17	-0.39	-0.26	-.16	-0.16
	(0.000)	*(0.000)*	*(0.000)*	(0.000)	0.000	0.000
Constant	-0.31	-0.22	0.63	-0.47	0.02	0.16
	(0.018)	*(0.008)*	*(0.000)*	*(0.000)*	*(0.744)*	*(0.045)*
YEAR FE	NO	YES	NO	NO	YES	NO
COUNTRY FE	NO	YES	YES	NO	YES	YES
*COUNTRY*YEAR*	NO	NO	YES	NO	NO	YES
R2	0.65	0.79	0.80	0.65	0.93	0.92
N. o.bs	198	198	198	309	309	309

Table 2. Decomposition of trade growth

	Bilateral Trade Growth	*GDP*	*Similarity*	*Trade Costs*	*Competition*
1870-1992	1025,4	646,1	-6,3	406,6	-21,0
	100%	*63%*	*-1%*	*40%*	*-2%*
1870-1913	406,5	203,9	-7,3	217,3	-7,4
	100%	*50%*	*-2%*	*53%*	*-2%*
1920-1939	-71,5	89,7	3,7	-167,0	2,1
	100%	*-125%*	*-5%*	*233%*	*-3%*
1950-1992	608,2	327,1	5,3	297,0	-21,2
	100%	*54%*	*1%*	*49%*	*-3%*

Figure 4. Decomposition of bilateral trade growth



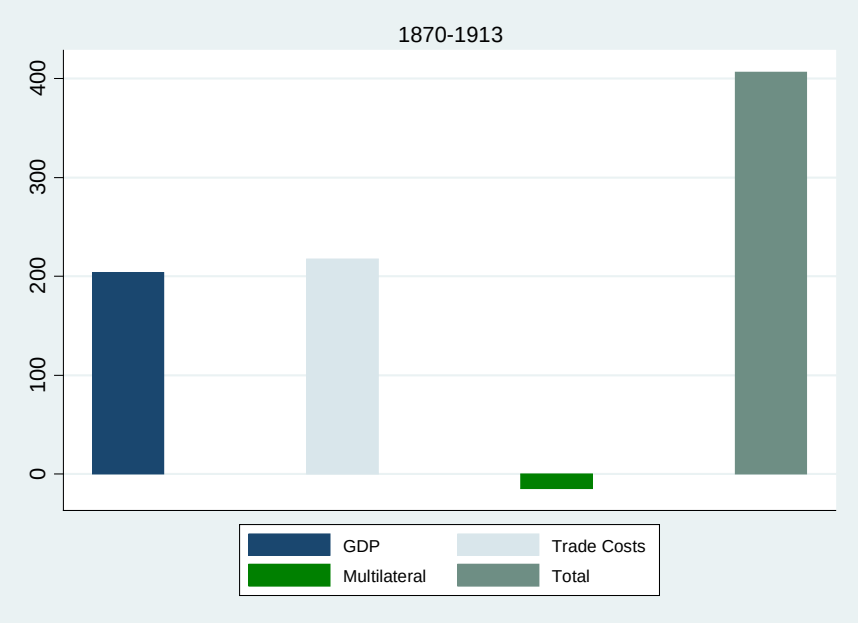


Figure 4. Decomposition of bilateral trade growth
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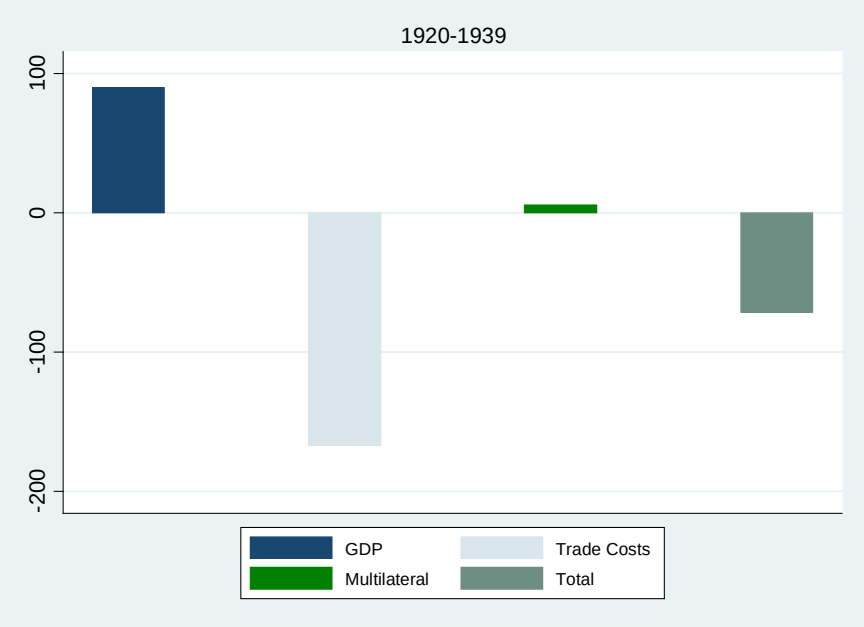


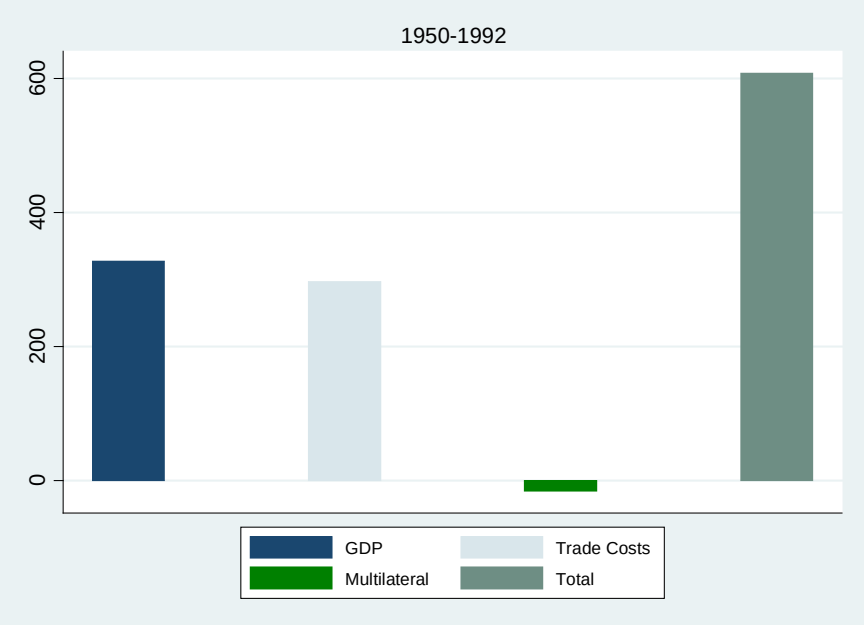


Figure 5. Trade flows decomposition by Country and period

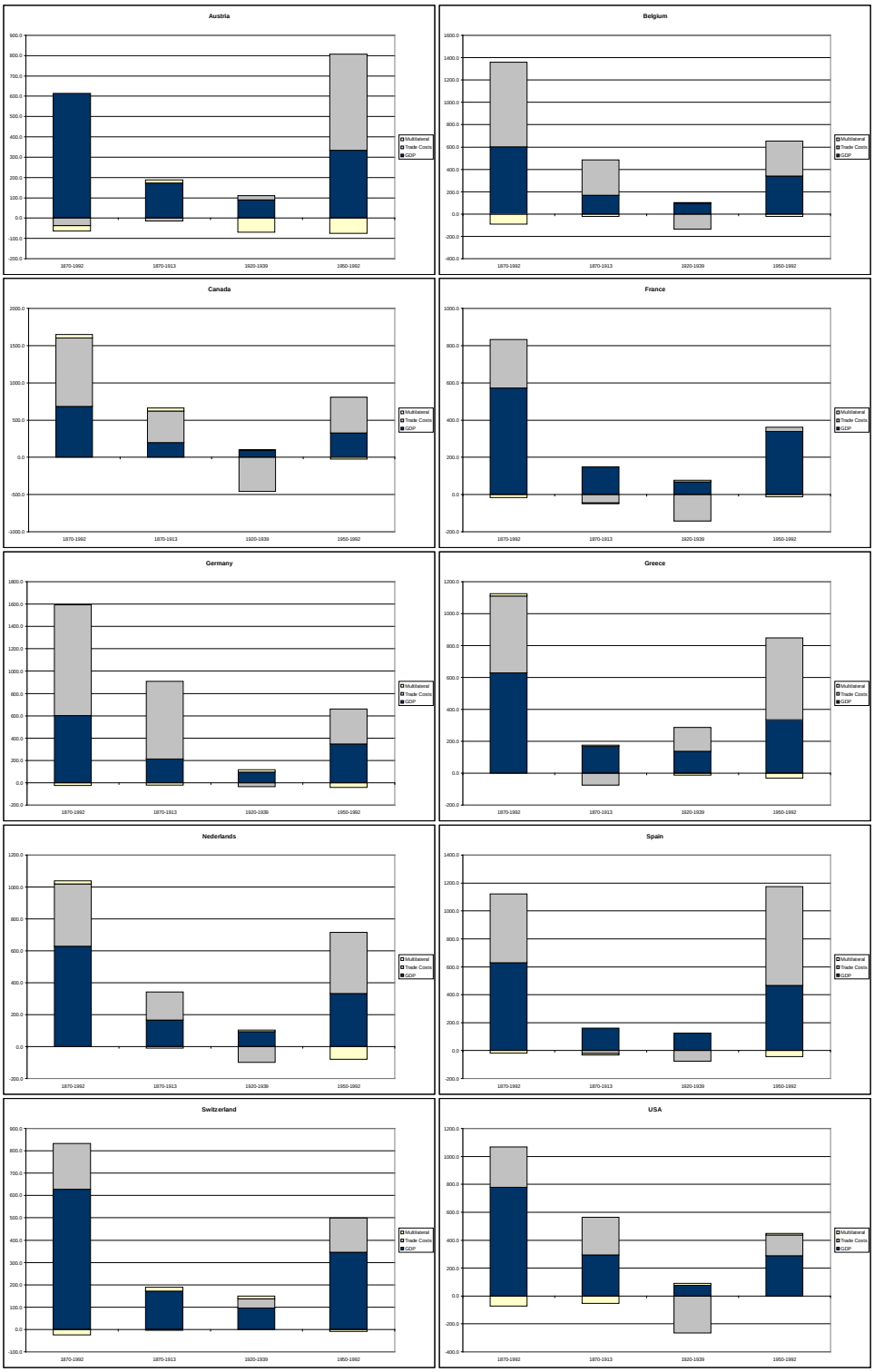
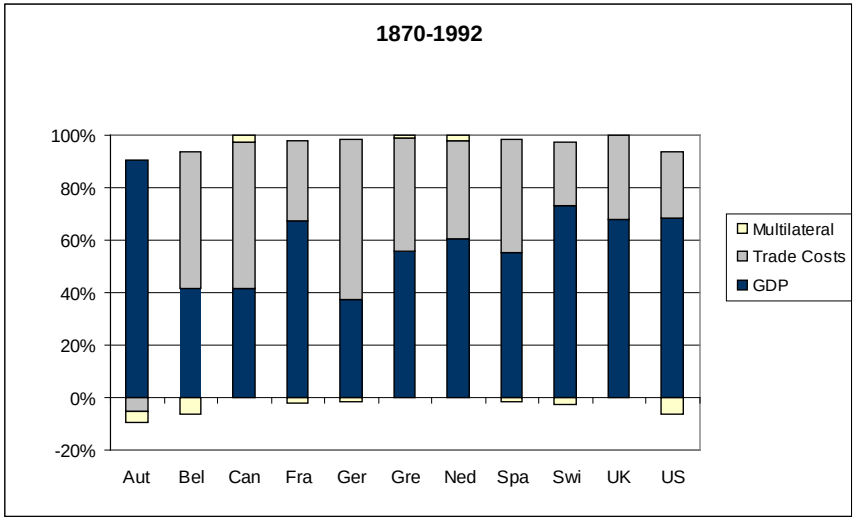
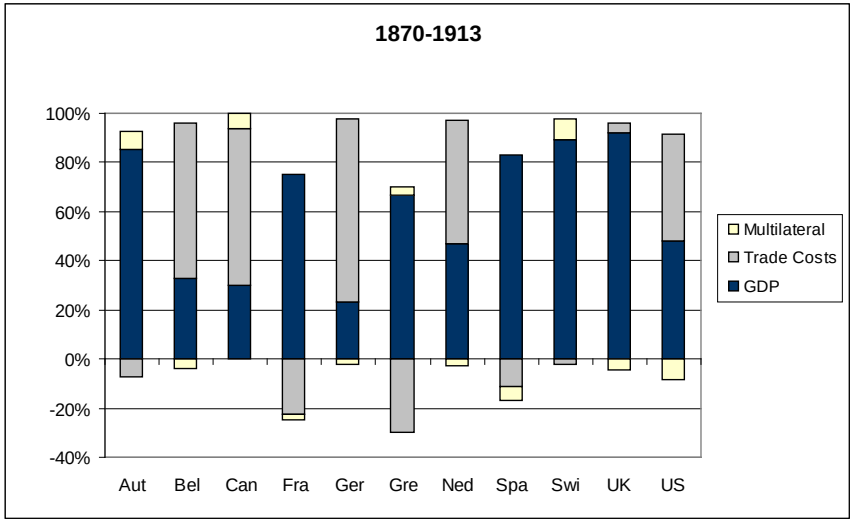
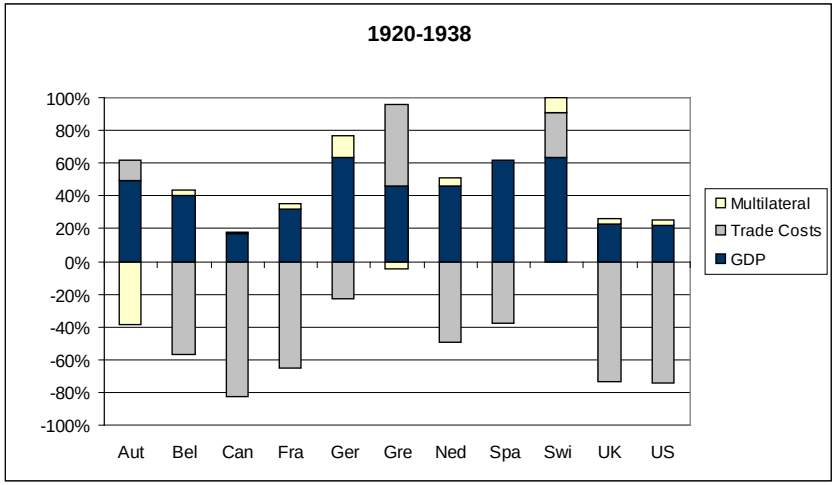


Figure 6. Trade flows decomposition by period and Country







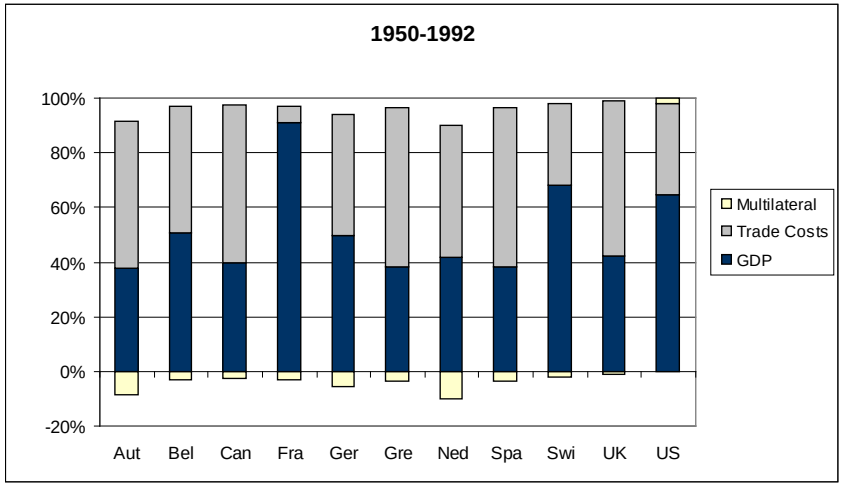


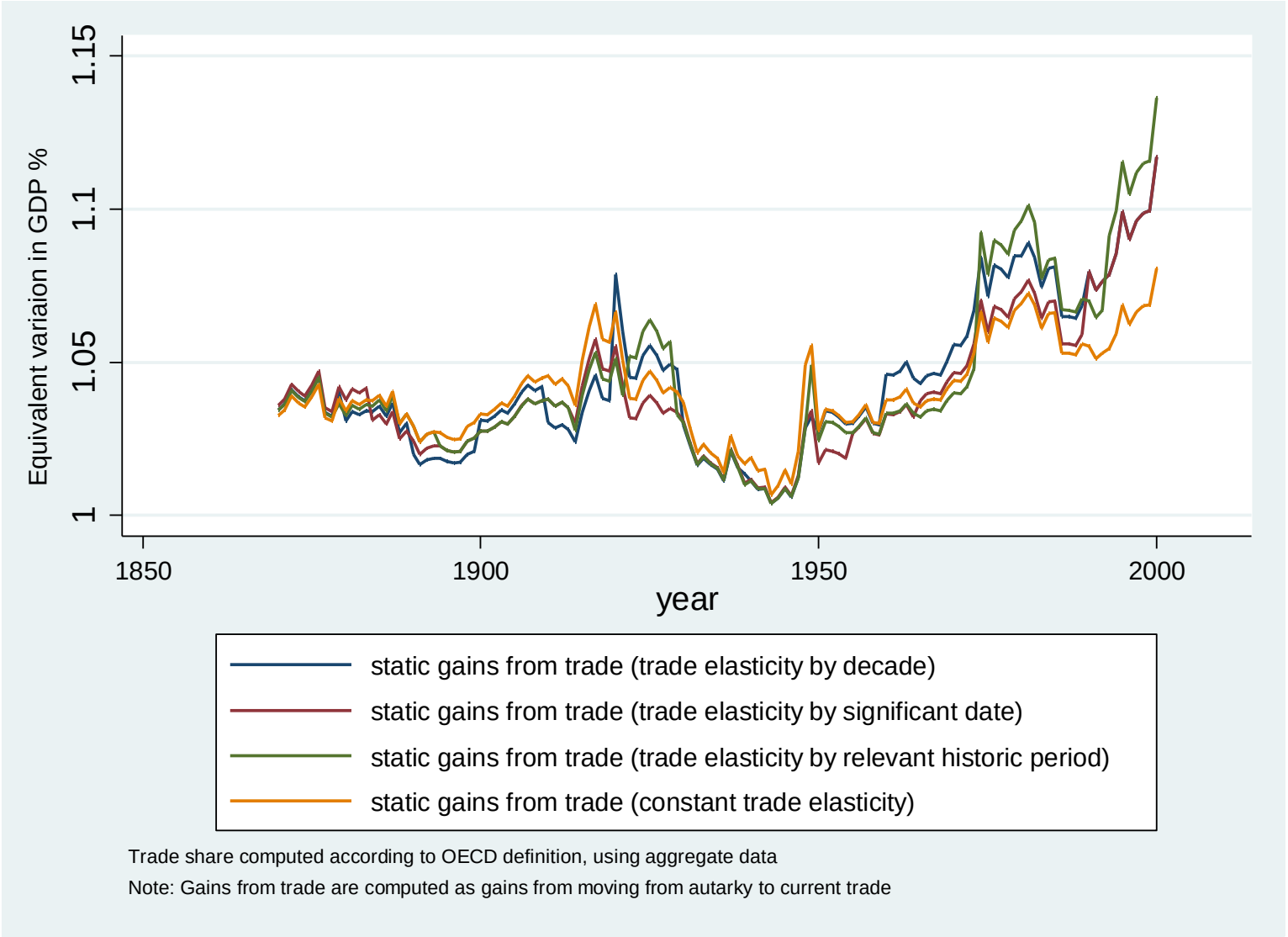
Table 3. Decomposition of Italian bilateral trade flows growth by Country and period

		GDP	Trade Costs	Multilateral	Total
AUT	1870-1992	614.1	-36.7	-26.7	550.7
	1870-1913	172.4	-15.1	14.8	172.1
	1920-1939	89.0	22.2	-69.4	41.8
	1950-1992	333.4	474.7	-75.0	733.0
BEL	1870-1992	601.4	758.0	-91.2	1268.2
	1870-1913	166.8	318.7	-20.0	465.5
	1920-1939	94.4	-133.7	7.7	-31.5
	1950-1992	340.4	312.5	-21.3	631.5
CAN	1870-1992	682.7	921.5	43.8	1648.1
	1870-1913	199.0	422.7	42.3	664.0
	1920-1939	93.5	-459.1	5.9	-359.7
	1950-1992	329.0	479.8	-21.8	787.0
FRA	1870-1992	572.8	259.7	-16.7	815.8
	1870-1913	149.0	-44.3	-4.5	100.2
	1920-1939	69.4	-141.2	6.4	-65.4
	1950-1992	339.6	21.3	-11.2	349.7
GER	1870-1992	601.3	991.6	-25.6	1567.2
	1870-1913	214.3	693.8	-20.7	887.4
	1920-1939	96.2	-34.7	19.8	81.3
	1950-1992	347.3	311.9	-40.1	619.2
GRE	1870-1992	630.0	481.5	14.8	1126.3
	1870-1913	167.6	-75.4	9.1	101.3
	1920-1939	136.8	149.5	-13.1	273.2
	1950-1992	335.5	513.7	-32.1	817.1
NED	1870-1992	629.1	389.4	20.5	1038.9
	1870-1913	166.0	176.9	-10.5	332.4
	1920-1939	93.6	-99.5	9.5	3.6
	1950-1992	332.0	382.7	-79.1	635.6
SPA	1870-1992	630.3	492.8	-17.5	1105.6
	1870-1913	160.8	-21.5	-11.1	128.2
	1920-1939	125.4	-75.9	-0.2	49.3
	1950-1992	466.7	706.3	-43.1	1129.9
SWI	1870-1992	627.3	206.3	-23.8	809.8
	1870-1913	171.9	-4.0	17.0	185.0
	1920-1939	95.5	41.3	13.3	150.1
	1950-1992	345.6	152.5	-9.3	488.8
UK	1870-1992	516.3	244.2	-1.4	759.1
	1870-1913	162.6	6.7	-7.4	161.9
	1920-1939	76.9	-252.7	13.1	-162.7
	1950-1992	259.5	344.6	-7.1	597.0
US	1870-1992	779.2	288.2	-72.6	994.8
	1870-1913	295.0	269.0	-51.8	512.2
	1920-1939	77.6	-265.1	12.4	-175.1
	1950-1992	289.6	148.5	9.9	448.1

Table 4. Decomposition of Italian bilateral trade flows growth by period and Country

1870-1992		GDP	Trade Costs	Multilateral	Total
	Aut	614.1	-36.7	-26.7	550.7
	Bel	601.4	758.0	-91.2	1268.2
	Can	682.7	921.5	43.8	1648.1
	Fra	572.8	259.7	-16.7	815.8
	Ger	601.3	991.6	-25.6	1567.2
	Gre	630.0	481.5	14.8	1126.3
	Ned	629.1	389.4	20.5	1038.9
	Spa	630.3	492.8	-17.5	1105.6
	Swi	627.3	206.3	-23.8	809.8
	UK	516.3	244.2	-1.4	759.1
	US	779.2	288.2	-72.6	994.8
1870-1913	Aut	172.4	-15.1	14.8	172.1
	Bel	166.8	318.7	-20.0	465.5
	Can	199.0	422.7	42.3	664.0
	Fra	149.0	-44.3	-4.5	100.2
	Ger	214.3	693.8	-20.7	887.4
	Gre	167.6	-75.4	9.1	101.3
	Ned	166.0	176.9	-10.5	332.4
	Spa	160.8	-21.5	-11.1	128.2
	Swi	171.9	-4.0	17.0	185.0
	UK	162.6	6.7	-7.4	161.9
	US	295.0	269.0	-51.8	512.2
1920-1939	Aut	89.0	22.2	-69.4	41.8
	Bel	94.4	-133.7	7.7	-31.5
	Can	93.5	-459.1	5.9	-359.7
	Fra	69.4	-141.2	6.4	-65.4
	Ger	96.2	-34.7	19.8	81.3
	Gre	136.8	149.5	-13.1	273.2
	Ned	93.6	-99.5	9.5	3.6
	Spa	125.4	-75.9	-0.2	49.3
	Swi	95.5	41.3	13.3	150.1
	UK	76.9	-252.7	13.1	-162.7
	US	77.6	-265.1	12.4	-175.1
1950-1992	Aut	333.4	474.7	-75.0	733.0
	Bel	340.4	312.5	-21.3	631.5
	Can	329.0	479.8	-21.8	787.0
	Fra	339.6	21.3	-11.2	349.7
	Ger	347.3	311.9	-40.1	619.2
	Gre	335.5	513.7	-32.1	817.1
	Ned	332.0	382.7	-79.1	635.6
	Spa	466.7	706.3	-43.1	1129.9
	Swi	345.6	152.5	-9.3	488.8
	UK	259.5	344.6	-7.1	597.0
	US	289.6	148.5	9.9	448.1

Figure 7. Static gains from trade, 1870-2000
(*compensating variation, percentage of real income*)

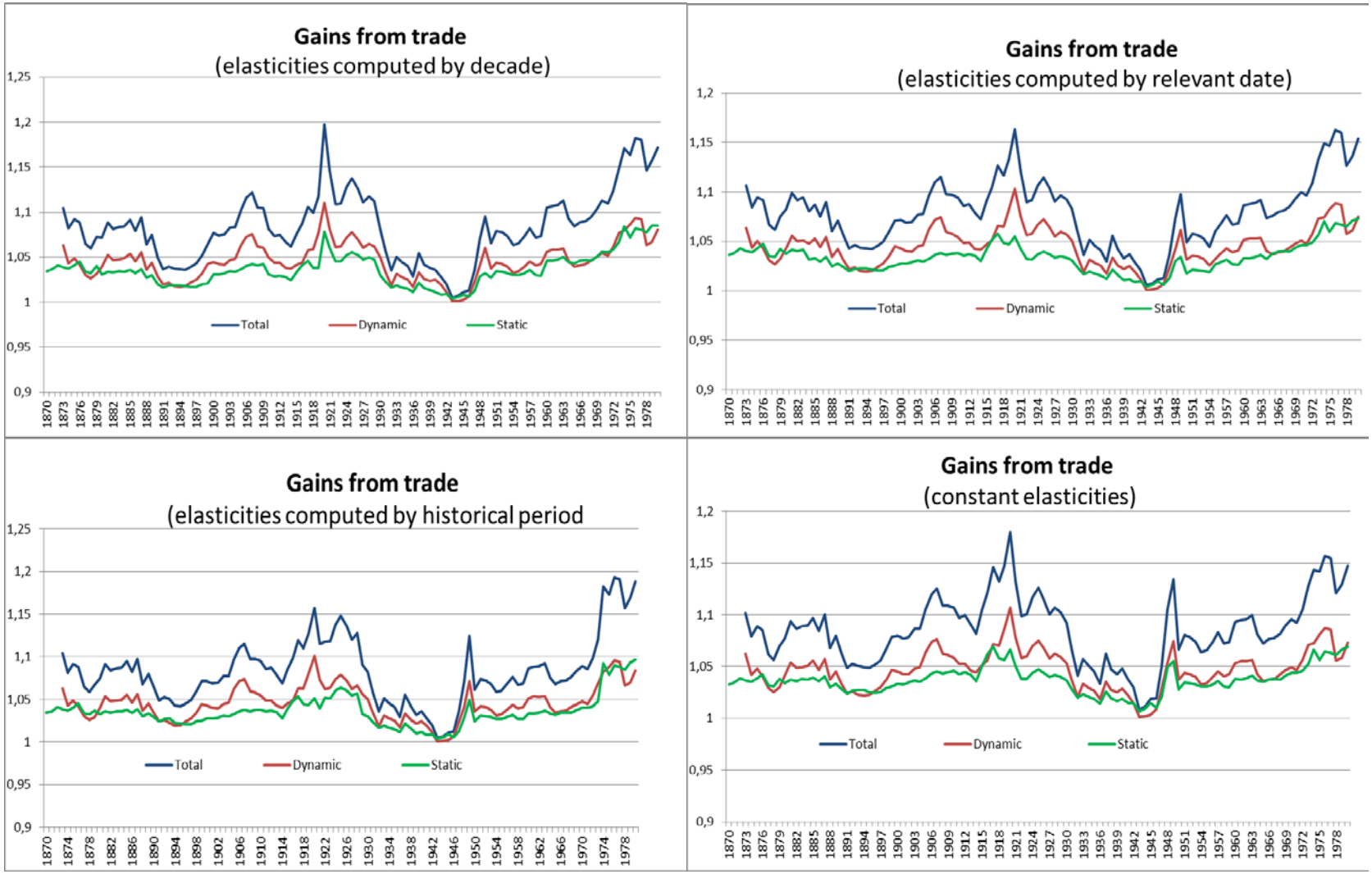


Trade share computed according to OECD definition, using aggregate data

Note: Gains from trade are computed as gains from moving from autarky to current trade

Figure 8. Total, dynamic and static gains from trade, 1870-1980

(*compensating variation, percentage of real income*)



Appendix

A.1 Trade Costs index

The method was developed by Novy (2009) and makes use of the insight that a change in bilateral trade barriers does not only affect international trade but also intra-national trade. Using gravity equation to find an expression for country i's intra-national trade:

$$x_{ii} = (y_i y_i / y^w)\ (t_{ii} / \Pi_i P_i)^{(1-\sigma)}$$

where t_{ii} represents intra-national trade costs. Equation (4) can be solved for the product of outward and inward multilateral resistance:

$$\Pi_i P_i = [(x_{ii}/y_i)/(\ y_i/\ y^w)]^{[1/(\sigma-1)]} - t_{ii}$$

The explicit solution for the multilateral resistance variables can be exploited to solve the general equilibrium model for bilateral trade costs. Gravity equation contains the product of outward multilateral resistance of one country and inward multilateral resistance of another country whereas this last equation (5) provides a solution for $\Pi i Pi$ It is therefore useful to multiply gravity equation (1) by the corresponding gravity equation for trade flows in the opposite direction, x_{ji}, to obtain a bidirectional gravity equation that contains both countries outward and inward multilateral resistance variables:

$$x_{ij}\ x_{ji} = [(y_i\ y_j)/y^w]^2 [(t_{ij} t_{ji})/(\ \Pi_i\ \Pi_j P_i P_j)]^{(1-\sigma)}$$

substituting from previous equation we obtain a gravity equation in which the size variable is not total income as in traditional gravity equations but intra-national trade $x_{ii}x_{jj}$.

Intranational trade does not only control for the countries economic size, but according to equation (5) it is also directly linked to multilateral resistance. The result can be rearranged as:

$$t_{ij}t_{ji}/t_{ii}t_{jj} = (x_{ii}x_{jj}/x_{ij}x_{ji})^{[1/(\sigma-1)]}$$

As costs between i and j can be asymmetric ($t_{ij} \neq t_{ji}$) and as domestic trade costs can differ across countries ($t_{ii} \neq t_{jj}$), it is possible to take the geometric mean of the barriers in both directions. It is also useful to deduct one to get an expression for the tariff equivalent:

$$T_{ij} = (t_{ij}t_{ji}/t_{ii}t_{jj})^{1/2} - 1 = (x_{ii}x_{jj}/x_{ij}x_{ji})^{[1/2(\sigma-1)]} - 1$$

A2. Trade elasticities

Estimates of trade elasticities where obtained following Simonovska and Waugh (2014). They were obtained as the inverse of the estimate of the parameter θ in equation (1), regressing for each

country pair the logarithm of the normalized bilateral import share on importer and exporter fixed effects and a measure of variable trade costs in logarithm plus a constant:

$$log\left(\frac{X_{ni}/X_n}{X_{nn}/X_n}\right) = \alpha + \alpha_i + \alpha_n + \theta log\tau_{ni} + \epsilon_{ni} \qquad (1)$$

The numerator of the normalized bilateral import share is the share of expenditure X_n of country n pertaining to its imports from its commercial partner i, whereas the denominator reflects the share of expenditure that country n sources from itself. Simplifying out X_n above and below the fraction line, the dependent variable was in practice computed as the log of the ratio of imports from country i to country n to n's expenditure on domestic goods, proxied by the importer's GDP minus its aggregate inputs.

Variable trade costs were instead provided in the dataset, as the tariff equivalent of the wedge capturing bilateral relative to domestic trade costs (cf. Jacks et al., 2011, for details).

To obtain a benchmark value, the estimation was initially performed over the entire sample for every country pair. The pooled regression was then restricted to the subsample of country pairs where Italy was the importer, clearly suppressing the importer fixed effect which is now indistinguishable from the constant:

$$log\left(\frac{X_{ni}/X_n}{X_{nn}/X_n}\right) = \alpha + \alpha_i + \theta log\tau_{ni} + \epsilon_{ni} \qquad (2)$$

Subsequently, the analysis tried to capture the likely time-varying nature of the parameter of interest, putting into place three different strategies in this respect (namely decadal estimation, structural break testing and historical periodization), which are described in detail in the next subsection.

1. The first approach followed was to run our equation decade-by-decade, arbitrarily imposing the time span over which the elasticity was supposed to vary to be 10 years long.
2. As a further improvement along this dimension, the regression was then run over the entire sample adding year dummies D to the equation, so as to detect significant years that could be used to test for the presence of structural breaks:

$$log\left(\frac{X_{ni}/X_n}{X_{nn}/X_n}\right) = \alpha_i + \alpha_n + \theta log\tau_{ni} + \sum_{k=1870}^{2000} \delta_k D_k + \epsilon_{ni} \qquad (3)$$

The coefficients of interest are now the δ_k's, which, if proven significantly different from zero, would signal the presence of a candidate year where to test for a structural break. Running regression (3) over the sample only involving Italy delivered a large number of potential breaks, namely 1883, the range 1938/1942, 1954, 1958, 1959, 1961, and the range 1964/2000. In order to cope with a likely low number of observations in short time periods, it was chosen to deal with as long time spans as possible, testing for breaks in 1883, 1938, 1954, 1964 and 1989. The Chow tests performed on these years rejected the null hypothesis of absence of break in all cases at least at the 1 percent significance level, once again confirming the validity of the intuition that trade elasticity may vary with time.

(3) Finally, a similar method was used testing for structural breaks in predetermined dates, building an ad hoc periodization based on supposedly relevant political or economic events. The first years chosen were 1878, 1887 and 1893, the first two on the basis of tariff reforms enacted in the early stages of the Italian Kingdom, while 1893 was the beginning of the Italian *Belle Epoque*, the dawn of the economic upturn called "Giolittian period that lasted until the beginning of WWI. Then, following the course of major historical events, 1913 marked the end of a peaceful period; 1921, right before the advent of Fascism (also coinciding with a further review of the tariff structure); pre- and post-World War II (1938 and 1948, the latter year chosen so as to encompass the creation of GATT as well). Moreover, the oil shock of 1973 was also included as a relevant date, as well as the signature of the Maastricht Treaty in 1992 (that coincided also with a major Italian economic crises). Some dates were also included in the analysis following the Italian history more closely: this was the case for 1928, acknowledging a significant change in the style of the fascist economic policy (from liberalization to the pursuit of autarky); 1963, as it represented and abrupt interruption and the beginning of the slowing down of the Italian "economic miracle" that had characterized the previous decade; 1982, a year of deep economic crisis and stagnation. All these dates considered, the analysis ended up with 13 relevant historic periods on which to test for structural breaks, which turned out to be all significant according to the Chow test.

A3. Dynamic gains estimation (equations in Sampson, 2013)

Observable/parameters
- Import penetration ratio: data from Baffigi (2013)
- Firm creation rate: data from Assonime (various years)
- Population growth rate: data from Baffigi (2013)
- Trade Elasticity: our estimates, Appendix A1
- *Elasticity of substitution: figures from Sampson (2013)*
- *Intertemporal elasticity of substitution: Dladla et al. (2014)*
- *Discount rate: figures from Sampson (2013)*