

**EQUALIZING EXCHANGE:  
TRADE LIBERALIZATION AND INCOME EQUALIZATION\***

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**ABSTRACT**

How does movement toward freer trade affect income disparity among countries? This paper attempts to shed some light on the issue by examining episodes of major postwar trade liberalization within specified groups of countries. The findings suggest a strong link between the timing of trade reform and income convergence among countries.

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## I. INTRODUCTION

In 1969, Arghiri Emmanuel wrote about the "unequal exchange" which he believed was brought about by the "imperialism of trade."<sup>1</sup> This paper provides evidence that movement towards free trade may actually have just the opposite effect, leading to a *reduction* in income disparity among countries.

Income divergence, or at best, nonconvergence, appears to characterize the behavior of most cross-country income differentials (see for example: Romer [1986, 1989] and Baumol [1986]). On the other hand, there has been some evidence [Baumol, 1986; Abramowitz, 1986; Baumol, Blackman, and Wolff, 1989; and Dowrick and Nguyen, 1989] of convergence within the OECD. Most of this convergence took place during the postwar period, which has also been a period of increasing trade liberalization. The question is, can these two episodes be related?

The factor price equalization (FPE) theorem [Samuelson, 1948, 1949, 1953; Helpman and Krugman, 1985] provides a framework for relating trade's impact to income convergence. Alternatively, the traditional growth literature [Solow, 1956 and 1957; Cass, 1965; Koopmans, 1965] postulates that, even in the absence of internationally mobile goods and factors, convergence to a steady state path should occur between countries provided that they have identical production technologies, population growth, savings rates, etc.

Abramowitz [1986] uses the catch-up hypothesis to explain his findings of convergence in labor productivity among the OECD countries. The premise of this hypothesis is that the potential for growth is greatest for those countries that are the farthest behind. A variant of this idea is provided by Jovanovic and Lach [1990] who posit that income inequality among countries is due to differences in the rate that countries implement new technologies. They state that

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<sup>1</sup> Samuelson [1975] referred to Emmanuel's proposition as "reformulated Marxist theory."

varying speeds of technology diffusion can account for large amounts of variation in levels of GNP. The question, in this context is, what determines the rate of diffusion? Dollar, Wolff and Baumol [1988] suggest that there exists "strong circumstantial evidence that technology diffusion through trade in goods and international investment ... [has] played an important role in the convergence of productivity levels" (p. 44).

The experience of the European Economic Community (EEC) provides a very useful arena for examining the link between freer trade and incomes. The attractiveness of the Community, particularly during its evolutionary period, is due to the fact that the EEC exhibited significantly increased trade, while exhibiting negligible improvements in factor flows [El-Agraa, 1985; Jensen and Walter, 1965; Balassa, 1975; Collins, 1975; Mayes, 1985]. An examination of the EEC also alleviates the question of sample selection which, as De Long [1988] pointed out, may affect the determination of convergence/divergence outcomes. The EEC represents a fixed grouping of countries<sup>2</sup> created with the goal of eliminating trade restrictions among its members. To isolate trade's impact on cross-country income disparity, the behavior of the Community's income differentials *during* the period of liberalization will be compared to their pre-liberalization years, as well as to other benchmark groups that vary in the degree and timing of their openness.

A formal agreement creating the European Economic Community was signed over thirty years ago, in 1957, between six countries<sup>3</sup> in Europe. The bulk of the economic integration by the original members of the Community took place during a ten year span, called the *transition period* which lasted from 1959 until 1968.

To get an idea of the relationship between the income differentials within the European Economic Community, and the *timing* of its trade liberalization, it is useful to examine the

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<sup>2</sup> The size of the EEC remained constant for a decade and a half.

<sup>3</sup> France, West Germany, Belgium, the Netherlands, Luxembourg and Italy.

behavior of the annual cross-country standard deviations of log per capita incomes.<sup>4</sup> The annual dispersion of real per capita income is plotted in Figure 1, along with the important dates in the integration of the EEC. The behavior of income differentials appears to indicate a strong relationship between the removal of trade barriers and reductions in the degree of income disparity across EEC countries.<sup>5</sup> This contrasts with the non-convergence, and even divergence that appears to be the rule in the other studies cited above.<sup>6</sup> Are these results due to an historical accident, or are they related to the movement towards economic integration by the EEC countries?<sup>7</sup> The remainder of this paper attempts to examine this issue.

### ***Methodology***

It is important to establish, from the outset, the boundaries of this paper. Its primary purpose is to provide a descriptive account of the relationship between trade and income disparity, within the context of a specific setting. No attempt is made to broaden the theoretical motivations (mentioned above) of why such a relationship should exist. The contribution of this paper is solely within the realm of empirically ascertaining the existence of such a linkage.

The timing of liberalization, as well as the extensiveness of its implementation, will be the key evidence for examining the impact of liberalization on income differentials. While the

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<sup>4</sup> Unless specified otherwise, the data source is Summers and Heston [1988].

<sup>5</sup> It should be pointed out that while "official" barriers were phased out, non-tariff barriers would sometimes be substituted instead. Trade in agricultural products was also exempted from some of the measures which governed the rest of the internal EEC trade. The bottom line, however, is that these aberrations were not strong enough to completely cancel out the general liberalization effects on the income differentials.

<sup>6</sup> Using cointegration techniques, Bernard and Durlauf [1990] conclude that, while they can find little evidence of convergence among 15 industrialized countries, there does appear to be significant convergence among a European subset of six of these countries (of which four were original members of the EEC, and one joined later).

<sup>7</sup> One obvious question is whether this is nothing but a continuation of a long-term convergence trend. Another possibility is that this reduction in income disparity is simply due to German recovery from the Second World War.

primary focus will be on the EEC (its liberalization was by far the most comprehensive, while trade between its members comprised most of their overall trade), other major instances of postwar trade liberalization are also examined. In these cases, the timing of trade reform differed from that of the EEC. These results are compared to benchmarks at opposite ends of the spectrum. At one end is the relationship among U.S. states, where there is relatively uninhibited movement of goods *and* factors, while at the other end are cases where liberalization was non-existent, or minimal in comparison.

Section two details the main features of the EEC trade liberalization, including evidence of its impact on trade. Section three examines the changes in income differentials within the EEC that have occurred as a result of the freer trade and compares these with other benchmarks. Other episodes of trade liberalization are examined in the fourth section. Section five provides alternative explanations for the convergence results while section six summarizes.

## II. LIBERALIZATION AND TRADE

### *Internal Tariffs*

The Treaties of Rome, signed in 1957, provided a relatively strict timetable for the elimination of internal tariffs. This *transition period* was implemented on January 1, 1959 and comprised three stages. Internal tariffs were reduced in a series of 10 percent drops at specified dates, with minimum targets set for the end of each stage (Figure 2). The customs union was completed on July 1, 1968, when all remaining internal tariffs were abolished and national customs duties in trade with the rest of the world were replaced by the *Common Customs Tariff*. The main difference between the EEC tariff reductions and those imposed by GATT was in their

scope. While GATT negotiations produced tariff cuts on a commodity-by-commodity basis, the EEC lowered them on all goods at once, in a step by step progression specified in advance at the time of the signing of the Treaties of Rome. This across-the-board form of tariff reductions did in fact have some exceptions, particularly regarding some agricultural products which were exempted from the overall timetable and were instead governed by special regulations. Internal agricultural quotas, as well as minimum prices, came to be replaced by variable levies.

It should also be noted that only the initial tariff reduction of 10 percent in 1959, and the final removal of all customs duties in 1968, were to be applied uniformly across all goods. Countries were given discretion in the degree of reduction they imposed on each commodity, as long as they averaged the 10 percent drops agreed upon in the original timetable. They were further required to reduce the internal duties on each product by at least 25 percent and 50 percent, at the end of the first and second stages of the transition period, respectively.

### *Internal Quotas*

The Rome Treaties decreed that all nonagricultural quotas between member countries become nondiscriminatory as of 1959. Furthermore, intra-EEC quotas were simultaneously increased by 20 percent on average, and by a minimum of 10 percent for any given product (Figure 2). Quota restrictions on industrial commodities were completely lifted by the end of 1961, with a few exceptions.

The following year, limits were imposed on the minimum levels of agricultural quotas, and all quotas between members became nondiscriminatory. Several were replaced altogether by a system of variable levies whose purpose was to compensate for price differences between the importing and exporting EEC countries.

### *The Impact on Trade*

The effect of this liberalization process on the Community's trade can be seen in Figures 3 and 4. Total imports from the non-EEC world divided by total EEC GDP are compared in Figure 3 to the ratio of total intra-EEC imports to GDP.<sup>8</sup> In the pre-transition period, the volume of imports from the rest of the world was stable, at approximately 11 percent of GDP. During these years, there was a slight, though significant, rise in the intra-EEC imports to GDP ratio. This coincided with the partial liberalization that had already begun between the countries which would later form the European Economic Community.

During the transition period that followed, imports from the rest of the world declined a little, relative to GDP, while the ratio of intra-EEC trade doubled. In the 12 years following 1973, when nearly all the barriers on trade between the members of the European Economic Community had been removed, the fraction of intra-EEC trade, out of GDP, stabilized and remained between 10 and 11 percent. This compares with a rise in the ratio of non-EEC imports to GDP, which was due in large part to the liberalization of trade with other industrialized countries (which included the Community's new members). This is illustrated in Figure 4. The less pronounced, but significant, increase in imports from the non-oil producing developing nations coincided with a concentrated effort on the part of the Community to aid these countries through partial and full waivers of many external EEC barriers. Imports from the oil producing countries experienced a *level* change in 1974. In the years that followed, the import ratio from these countries remained at the higher level, albeit with much greater fluctuations than before.

The rise in the importance of trade within the EEC contrasts with the declining share of trade among the top 25 non-EEC countries in the world as well as among the 14 non-EEC

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<sup>8</sup> Data source: IMF *International Financial Statistics* and *Direction of Trade Statistics*.

countries with incomes that ranged (in 1960) between the wealthiest and poorest EEC countries (see Figures 5 and 6 respectively).<sup>9</sup>

### **III. LIBERALIZATION AND INCOME CONVERGENCE**

For convergence to occur, there must exist a negative relationship between a country's initial level of per capita product and its per capita growth rates. In a sample of 98 countries, Barro [1991] calculated a correlation coefficient of 0.09 for the years 1960 through 1985, indicating that average annual rates of growth (ROGs) are uncorrelated with initial levels of income. In the case of the EEC, however, this relationship was found to be significant (at the 1 percent level), with a correlation coefficient of -0.95 for the years 1950 to 1985.

The objective of the next two parts of this section will be to relate the convergence more decisively to the actual removal of trade barriers. This is done by: (1) contrasting the postwar period to the years preceding World War II, and; (2) examining the income differentials of the three countries that joined the Community in 1973.

#### ***Comparison of Postwar Period with Earlier Trends***

Could the postwar convergence among the EEC countries be due to shocks induced by the Second World War? In other words, was the postwar fall in the disparity of incomes due primarily to the rebuilding of war-shattered economies, or, alternatively, was it a continuation of

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<sup>9</sup> Saudi Arabia was excluded from both graphs due to poor and incomplete direction of trade and GDP data. The United States was omitted from the top graph because it was an outlier that exhibited a rising share of imports to GDP, while its extremely large size (as a producer and trader) reversed the otherwise declining trade share for the remainder of the group. The U.S. trading behavior is further discussed in section four. The countries included in these two groups are listed in the Appendix.



a long-term convergence trend? Verification of either of these scenarios would weaken the case for a link between trade liberalization and income convergence.

Using Maddison's [1982] data, it was possible to analyze these alternative propositions by calculating the standard deviations ( $\sigma$ 's) for the founding members of the EEC all the way back to 1870.<sup>10</sup> The standard deviations displayed in Figure 7 measure the income dispersion without Germany. The country is omitted to show that the postwar convergence which took place was not simply an outcome of German rebuilding following the war.<sup>11</sup>

The behavior of the  $\sigma$ 's clearly indicates that, during the prewar years, *neither* of the above two scenarios appears to hold. The dispersion of real per capita incomes was fairly stable from 1870 until the mid-1950's, with the  $\sigma$ 's fluctuating between 0.194 and 0.268. Only after the onset of trade liberalization did the standard deviations exhibit a level change (the minimum level, of 0.104, was attained in 1968, the final year of the transition period).

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<sup>10</sup> Maddison's data includes all of the original EEC countries, with the exception of the smallest, Luxembourg. From Summers and Heston's data, however, it can be shown that exclusion of Luxembourg does not appreciably alter the main conclusions enumerated above. Therefore, its omission here should not be considered too serious a problem.

<sup>11</sup> Germany was always among the poorest, in per capita terms, of the six countries. Today, it is one of the wealthiest countries in Europe. As a result of its heightened prosperity, it might be claimed that all of the convergence that has been witnessed within the EEC is due to the behavior of Germany. Thus, its exclusion should bias the results away from convergence.

### *Income Behavior of the Three New EEC Member-Countries*

Shifting the focus to the next three countries to join the EEC (Ireland, Denmark and the United Kingdom) examines the question of whether their income differentials behaved in a similar manner to those of the original Six during the entire postwar period, despite the differences in the timing of their trade reforms. Furthermore, if these countries exhibited convergence upon elimination of their trade barriers, was this behavior any different than their pre-liberalization behavior?

Figure 8 displays the annual disparity among the Three. In contrast with the convergence that occurred among the Six, the  $\sigma$ 's of the Three actually increased until the mid-sixties. At that time, the countries began to relax the trade restrictions that existed among themselves and later in the decade they began to liberalize trade with the Six. This coincided with a stabilization in the  $\sigma$ 's, followed by a reduction in the degree of income disparity. The rise in the income differentials of the Three during the eighties coincides with an increase in the  $\sigma$ 's of the Six. This could be due to expansion of the EEC to include Greece (and later Spain and Portugal), as well as heightened benefits to LDCs.

### *Comparison of the EEC to Opposing Benchmarks*

While the EEC countries have exhibited a significant reduction in the degree of income disparity amongst themselves, this has not been a prevalent feature of the international data. The remainder of this section focuses on a comparison of the EEC with opposing benchmark cases.

United States evidence will be used as a best-case scenario for what may be accomplished within a completely integrated world economy, where there is relatively unrestricted movement of goods *and* factors.<sup>12</sup> Empirical evidence [Ben-David, 1990; Barro and Sala-i Martin, 1992]

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<sup>12</sup> Data source: U.S. Department of Commerce, Bureau of Economic Analysis.

suggests that income differentials between U.S. states have exhibited a significant decline over much of the recent century. At the other end of the spectrum is the cross country, or *world* case, where there exist curbs on the mobility of goods and factors between countries. The EEC provides the intermediate case that depicts a steady liberalization of trade that places it between the restrictive world case and the free trade, free factor flow, United States' case.

In 1950, the average income dispersion in the European Economic Community was 30 percent higher than in the United States. However, as can be seen in Figures 9 and 10, the  $\sigma$ 's for the United States and the EEC became very similar. This is in contrast to the degree of income inequality across the 107 market economies (marked "world" in the figure). Partitioning the world also yields divergence for most income groups [Ben-David, 1990], though the high-income groups exhibit fairly stable standard deviations. This is highlighted in Figure 9 by the income differentials between the top 25 countries (in terms of 1960 per capita income). This lack of a significant increase, or decrease, in disparity, is very similar to the relatively stable income differentials displayed by the EEC members in the years *before* they began to remove their internal barriers on trade (see Figure 7). However, once these barriers were eliminated, the EEC countries achieved the rates, and even levels, of convergence found within the United States - despite the fact that interstate factor flows were considerably more widespread and uninhibited than they were within the European Community.

The following model may be used to describe the convergence/divergence behavior of each group. Let

$$(1) \quad y_{i,t+1} - \bar{y}_{t+1} = \phi (y_{i,t} - \bar{y}_t) ,$$

where

$y_{i,t}$  = country  $i$ 's log per capita income in year  $t$

$\bar{y}_t$  = unweighted average of the log per capita incomes for the group in year  $t$ .

Letting  $z_{i,t} = y_{i,t} - \bar{y}_t$ , the above equation may be rewritten as

$$(2) \quad \Delta z_{i,t+1} = -\kappa z_{i,t}$$

where  $\Delta z_{i,t+1} = z_{i,t+1} - z_{i,t}$ . The convergence coefficient,  $\kappa$ , which equals  $1-\phi$ , represents the rate of convergence of country  $i$ 's per capita income to the group's average income level.<sup>13</sup> The larger the  $\kappa$ , the faster the convergence. This model is used to test how the convergence behavior within the EEC compares to the benchmark cases.

To estimate the equation, the countries of each group were pooled together. In such instances, there arises a question regarding the robustness of the results with respect to outlier countries (should they exist) as well as the possibility of the sample beginning, or ending, in years that exhibited particularly large, or small income discrepancies and thereby influencing the final outcomes. The convergence results in Table 1 were tested with this in mind and the reduction in income differentials, when these are reported, was found to be robust among the group members.<sup>14</sup> Two-tailed  $t$ -tests were calculated in each case to determine whether the estimated  $\kappa$ 's differ significantly from zero (the standard deviations for the  $\kappa$ 's appear in parentheses). The number of years required for the average disparity to be cut in half (when  $\kappa > 0$ ), or doubled (when  $\kappa < 0$ ) are indicated in the two columns on the right.<sup>15</sup>

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<sup>13</sup> Squaring both sides of Equation 1 and then summing over the countries gives the relationship between  $\sigma_t$  and  $\sigma_{t+1}$ , where  $\phi$  represents the rate of decline (if  $\phi < 1$ ) in the group's average level of dispersion (when the group averages are geometric means).

<sup>14</sup> For example, exclusion of the two EEC members that lost WWII, Germany and Italy (who also happened to be the two poorest EEC countries in 1950), does not alter the significant convergence among the remaining countries. Alternatively, removal of the wealthiest country, as well as the two wealthiest countries, still leaves significant convergence among the other EEC countries. Ben-David and Bohara [1992] use the Seemingly Unrelated Regression approach to account for the existence of contemporaneous shocks and find that the postwar convergence within the EEC is still significant while prewar incomes did not converge.

<sup>15</sup> The half-life ( $x$ ) may be calculated as follows. If  $z_{t+1} = \phi z_t$ , then  $z_{t+x} = \phi^x z_t$ . Since  $z_{t+x} = .5z_t$  by definition, then  $.5z_t = \phi^x z_t$ , or  $.5 = \phi^x$ . Taking logs of both sides and dividing by  $\log \phi$  gives  $x$ .

The convergence coefficient for the EEC countries is not significantly different from unity during the prewar years, implying that the disparity between the countries remained relatively constant. During the postwar years, however, there occurred a very significant convergence, with the strongest decline in the income disparity taking place during the transition period. It is interesting to note that the half-life during the transition period was very similar to the half-life of the United States convergence over the past half century.

The *world* was examined as one large group, as well as in smaller breakdowns of the wealthier countries. The group of 107 countries displayed a propensity towards doubling their average income gap within 94 years. The top 25 industrialized countries exhibited no significant tendency in either direction, which is quite similar to the prewar "stability" of the EEC countries. All 14 countries with per capita incomes below Luxembourg (the wealthiest nation in the EEC in 1960) and above Italy (the poorest) were lumped together as a comparison group that had achieved approximately the same level of development and the same degree of income disparity in 1960 as that which existed within the European Economic Community. This group showed no inclination whatsoever towards convergence over the next quarter century.

#### **IV. LIBERALIZATION AND INCOME DISPARITY ELSEWHERE**

While convergence has not appeared to be the dominant trend for most countries, there is evidence that income differentials among OECD countries have been declining during the postwar period. Although the EEC comprises a sizable proportion of these countries, not all the OECD convergence is due to EEC convergence. Furthermore, the *timing* of the EEC convergence was not identical to the timing among the other countries.

The impact of trade on convergence within the OECD becomes somewhat more plausible when one considers the origins of the OECD. Its predecessor, the OEEC (Organization for European Economic Cooperation), was established in 1948 to promote free trade within Europe and to provide suggestions regarding the distribution of American aid, which was contingent on relaxation of obstacles to trade. Most of the OEEC's success, as far as trade liberalization was concerned, came with the removal of up to 80 percent of the quantitative restrictions [Bourdot, 1988; Graduate Institute of International Studies, 1968] between its member countries, though it met with less success in eliminating tariff barriers.

In the sixties the OEEC was supplanted by the OECD (Organization for Economic Cooperation and Development) with the addition of non-European countries. Some of the trade liberalization within the OECD resulted from multilateral agreements under the auspices of the GATT, while a considerable amount of the elimination of trade barriers was carried out within subgroupings of countries (the most prominent of these being the EEC).

Figure 11 and Table 2 provide a comparison of the major postwar tariff reforms. While there were five earlier postwar multilateral conferences, the Kennedy Round was by far the most important [Preeg, 1970]. It was also the first time that the GATT adopted across-the-board tariff reductions (which replaced the earlier item-by-item approach) of the type first implemented by the EEC. Beginning in 1968, and continuing over the next five years in equal installments, tariff reductions on industrial products, averaging approximately 35 to 40 percent (with two-thirds of the cuts exceeding 50 percent), were carried out by the signatories of the Kennedy Round.

Two of the non-European countries belonging to the OECD, the United States and Canada, provide an interesting illustration of the behavior of income differentials and the possible effects of trade liberalization. Until the late sixties, the United States and Canada - who were also the primary trading partners of one another - exhibited an income gap that tended to

fluctuate between 0.15 and 0.22 (Figure 12). With the implementation of the Kennedy Round Agreement, the fall in tariffs coincided with a noticeable drop in the income gap between the United States and Canada.

Among the European countries, creation of the European Economic Community in the late fifties by the members of the European Coal and Steel Community followed the breakdown of talks on a pan-European free trade area. Subsequently, an additional European trade group was formed by some of the countries that had been unable to come to terms with the EEC. This group, called EFTA (the European Free Trade Association), comprised eight countries,<sup>16</sup> though Finland was officially just an associate member due to the sensitivities of its Soviet neighbor, and Portugal received exemptions from clauses requiring the abolishment of trade barriers (in fact, it was allowed to implement additional tariffs in some instances [Graduate Institute of International Studies, 1968] and for this reason, Portugal will not be included in the subsequent analysis). EFTA began abolishing tariffs on trade in manufactured goods in 1961 and completed the process by 1967. Three times during this period, the UK, Denmark, and Norway applied for EEC membership, finally signing the Treaty of Accession in January, 1972. While Norway eventually opted to stay out of the EEC, the UK and Denmark, together with Ireland decided to join, becoming members of the EEC in January 1973. The remaining EFTA countries each tried to come to terms with the EEC during the sixties, but without success.

Austria, which ranked second in terms of per capita income among the five remaining countries before WWI, had fallen to last place by the end of WWII. After the Second World War, it rebounded dramatically and this led to a steady decline in income differentials among the five throughout the postwar period. Austria however appears to be an outlier, as income differentials among the remaining countries (Switzerland, Sweden, Finland and Norway) stayed

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<sup>16</sup> Austria, Denmark, Finland, Norway, Portugal, Sweden, Switzerland, and the United Kingdom.

fairly steady until the early sixties, beginning a slight decline during EFTA's liberalization period from 1961 through 1967. But the biggest decline in  $\sigma$  came *after* EFTA had abolished its internal trade barriers (Figure 14).<sup>17</sup> One possible explanation may be that, with the exception of the United Kingdom, the size of the EFTA countries is very small (compared to the EEC) and the ratio of their internal trade to their external trade is fairly small.<sup>18</sup> A much larger proportion of EFTA's trade was with the EEC, so trade liberalization with the EEC may have had more of an impact on disparity within EFTA than its own, internal, liberalization.

Tariffs between EFTA and the EEC were reduced starting in mid-1968, in accordance with the Kennedy Round Agreements. Further agreements between the EEC and the EFTA countries provided for the continuation of this process, until the eventual elimination of nearly all tariffs on industrial goods by 1977 (the impact of this agreement on EFTA imports from the EEC may be seen in Figure 15).<sup>19</sup> In fact, not only did disparity within EFTA decline from 1968 through the mid seventies, so did the income gap between the EFTA and EEC mean incomes.

Table 3 gives an indication of how the timing of the convergence differed between the EEC and the other groups. The postwar period is divided into the four periods. In period one, which ran from 1951 to 1958 (the years prior to the formation of the EEC and EFTA), none of the groups exhibited significant changes in their levels of disparity. However, the differences between the EFTA countries and the EEC were reduced during this period. This may be related

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<sup>17</sup> Income disparity among all six EFTA countries (that is, with the inclusion of the United Kingdom and Denmark) was very similar to that of the four.

<sup>18</sup> The ratio of EFTA 6's internal trade (measured by its imports) to its total imports rose from 17 percent (8 percent for the EFTA 4) prior to liberalization, to 22 percent (12 percent for the EFTA 4) by the end of the transition period in 1967. By comparison, total intra-EEC imports comprised 46 percent of total EEC imports by the end of their transition period, up from 30 percent at its inception.

<sup>19</sup> Trade reform with the EFTA countries that became EEC members in the early seventies proceeded at the same pace as the overall liberalization between the EEC and the countries that remained in EFTA.



to the impact of the OEEC in abolishing 80 percent of the quantitative restrictions in Europe during the 50s.<sup>20</sup> The EEC's transition years of trade liberalization comprise the second period, which extends from 1959 until 1967 (this period also includes EFTA's liberalization years). The results corroborate the visual evidence of significant convergence only among the EEC countries.

The third period begins with the implementation of the Kennedy Round agreements and ends when all tariffs between the EEC and EFTA were abolished.<sup>21</sup> In the case of the United States and Canada, only the five years of the Kennedy Round tariff cuts plus one additional year were used. During this period, the EEC displayed no convergence tendencies, compared with the significant convergence in EFTA and between the United States and Canada as well as between EFTA and the EEC. The post-liberalization years comprise the final period and none of the groups gives any indication of significant convergence or divergence.<sup>22</sup>

Ben-David [1993] uses a different method to gauge the relationship between the timing of trade reform and the reduction in income disparity. By creating indexes of trade barriers (TBI's) within each group, the study finds that annual changes in disparity are significantly related to the annual changes in the TBI's, and are not related to a simple straight line trend during the postwar years.

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<sup>20</sup> It is possible that these restrictions were more extensive (prior to their elimination) between the two groups of countries than within them. This might explain why the reductions among the EEC countries and among the EFTA countries were not significant.

<sup>21</sup> The EEC's transition period actually ended in July, 1968. However, since the Kennedy Round agreements also became effective in 1968, the year was used as the beginning of the third period.

<sup>22</sup> It is interesting to note that the EEC and EFTA convergence episodes were not a reflection of European-wide convergence. In fact, income differentials among the remaining European countries who were neither members of EFTA nor among the first nine members of the EEC, exhibited no tendency towards income convergence (or divergence for that matter) during the entire postwar period. This lack of convergence closely resembles the fairly stable income differentials in the prewar EEC as well as among the other postwar industrialized countries that did not significantly liberalize their trade.

Other than the EEC, EFTA and the GATT sponsored agreements, there have been several other attempts at liberalizing trade on a regional basis (e.g., in South America, Africa, and Southeast Asia). Since these met with far less success in eliminating trade barriers than their European counterparts, there was very little, if any, impact on income disparity among these countries that might be attributed to trade reform.

## V. SUMMARY AND CONCLUSIONS

This paper examined the proposition that liberalization of trade may contribute to income convergence. The primary focus of this analysis was on the six original members of the European Economic Community.

During the postwar period of trade reform, the convergence of incomes within the EEC was found to be quite substantial. The link between trade liberalization and income convergence was demonstrated in a couple of settings related to the Community. Examination of pre-WWII data indicates that the income convergence witnessed after 1950 was not due to some enormous earlier divergence caused by World War II (*i.e.* postwar  $\sigma$ 's were not returning to some earlier level) nor was it a continuation of some long-term trend as was the case within the United States. In a related example, the  $\sigma$ 's of the next group of countries to join the EEC (in 1973) were examined. Not only did the incomes among the three new members fail to replicate the behavior of the original Six and converge during the postwar years, the degree of disparity actually increased. Their income differentials began to fall only after these countries began to remove the trade barriers amongst themselves and with the six original members of the Community.

The focus of the analysis then shifted to a comparison of the EEC with other benchmark cases. The United States, which is characterized by (1) a relative absence of barriers on commodity flows and factor movements; and (2) a central government, provides an illustration of the type of income convergence that an integrated world economy might exhibit. The behavior of income differentials at the opposite end of the mobility spectrum, where there are restrictions on the movements of both goods and factors, was also examined. The 107 market economies in the sample exhibited significant income divergence. A noticeable lack of convergence was also evident among the world's 25 wealthiest countries, as well among the 14 countries with incomes in the range of the EEC spectrum. This was very similar to the prewar behavior of income differentials between the countries that would later make up the Community, which were also fairly constant and high. However, as trade became more liberalized, the EEC incomes began to converge, at rates of income convergence that closely resembled the rates observed in the U.S. among states.

The postwar convergence among OECD countries may also be related to their liberalization of trade. The timing of income convergence among the non-EEC countries differed from the EEC convergence and it coincided with the Kennedy Round agreements and (in the case of the EFTA countries) the EFTA-EEC agreement for trade liberalization.

To summarize, convergence among specific industrialized countries does not appear to be due simply to their being developed since the convergence phenomenon was not apparent among other industrialized country groupings nor among these same countries prior to their liberalization of trade. Furthermore, the convergence within the EEC and EFTA does not appear to be due to any European-wide movement towards reductions in income disparity, as evidenced by the lack of convergence among the non-EEC and non-EFTA European countries. When evidence of convergence was found, it appeared to closely coincide with the timing of trade

reform among major trading partners. Different periods of liberalization were related to different periods of convergence.

The results in this paper provide prima facie evidence that trade liberalization may have an impact on incomes, even to the extent of bringing about the sort of convergence results attained in the integrated economy case, as exemplified by the United States. In the absence of free trade, however, there is no reason to assume convergence in income levels, as is evidenced by the analysis of the world case.

## DATA APPENDIX

The per capita GDP data used in this paper comes from Summers and Heston [1988] and Maddison [1982]. Per capita personal income data from the Bureau of Economic Analysis [1984] was used for the U.S. states.

The intra-group trade statistics were calculated by summing the imports by each country from the remaining group members and dividing by the group's total aggregate GDPs. The external trade statistics (in the case of the EEC) use the same denominator as the in the intra-EEC measure while the numerator sums up total imports (from external sources) into the EEC countries. Trade data came from various IMF *Direction of Trade Statistics* yearbooks while the aggregate GDP data came from various IMF *International Financial Statistics* yearbooks.

Groups examined include the following countries. EEC 6: Belgium, France, Germany, Italy, Luxembourg, and the Netherlands. EEC 3: Denmark, Ireland, and the United Kingdom. EFTA: Austria, Denmark, Finland, Norway, Portugal, Sweden, Switzerland, and the United Kingdom. Mid-14: Australia, Austria, Canada, Denmark, Finland, Iceland, New Zealand, Norway, Saudi Arabia, Sweden, Trinidad and Tobago, United Kingdom, Uruguay and Venezuela. Top 25 include the mid-14 plus Argentina, Chile, Iraq, Ireland, Israel, Japan, Mexico, South Africa, Spain, Switzerland, and the United States. All 48 states within the continental United States comprised the intra-U.S. group.

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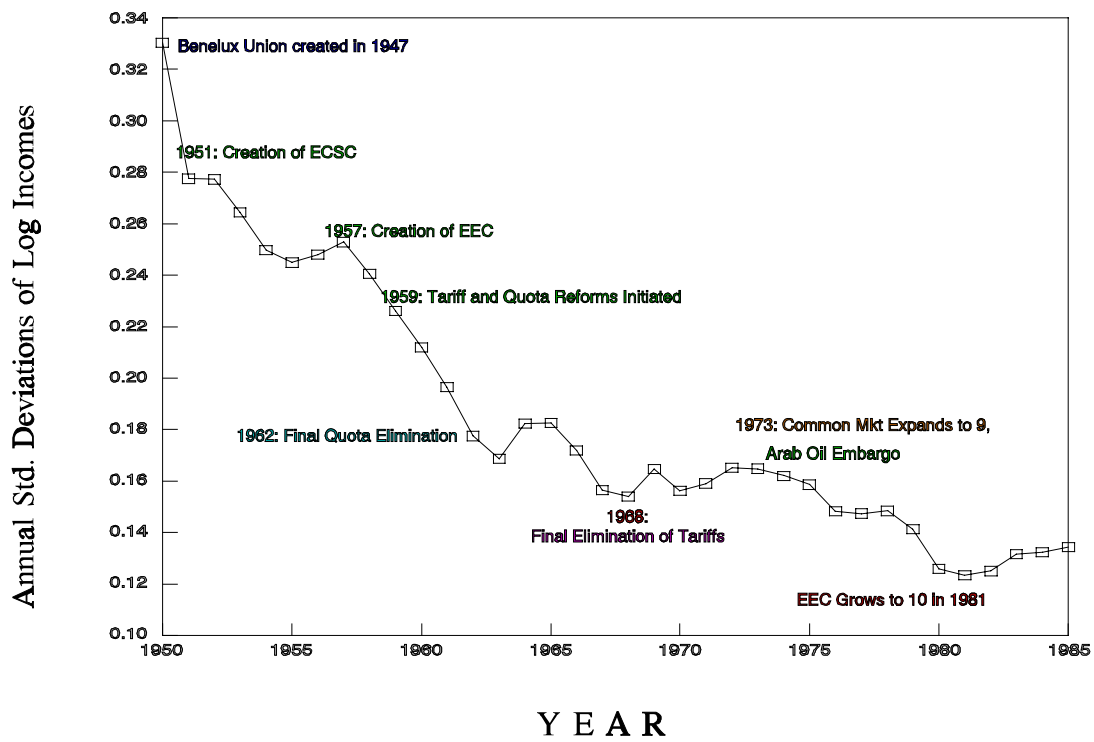
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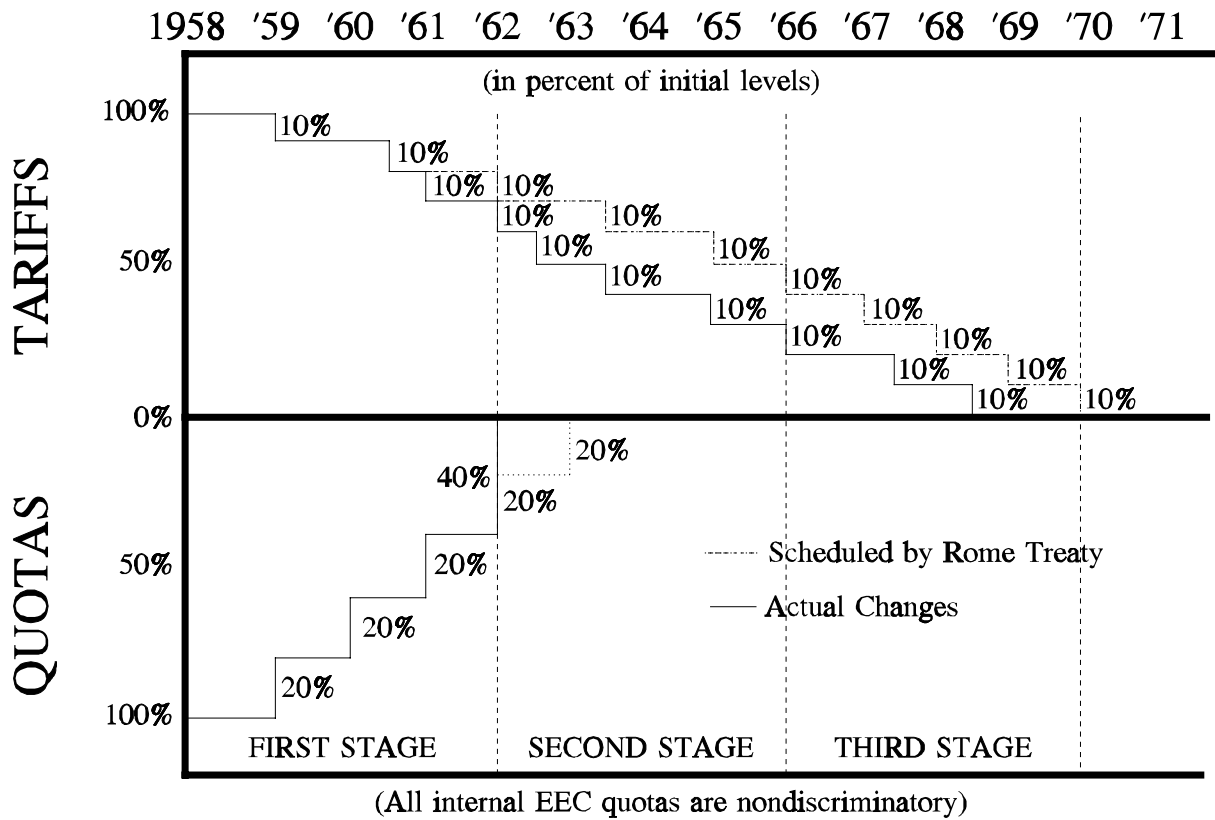
**FIGURE I**

## Per Capita Income Dispersion

Between Six Original EEC Countries, 1950-1985



**FIGURE II**  
**REDUCTION OF INTERNAL EEC TRADE BARRIERS**



This graph was first used by Jensen and Walter [1965]. It was slightly altered here to include information from Bourdot [1988]. The first tariff reduction was 10 percent on *all* goods. The remaining reductions were 10 percent *on average*, and as little as 5 percent on any *one* good. Quotas were increased in steps of 20 percent *on average*, with a minimum of 10 percent on any *one* good.

FIGURE III

Ratio of EEC Imports to GDP

(in percent)

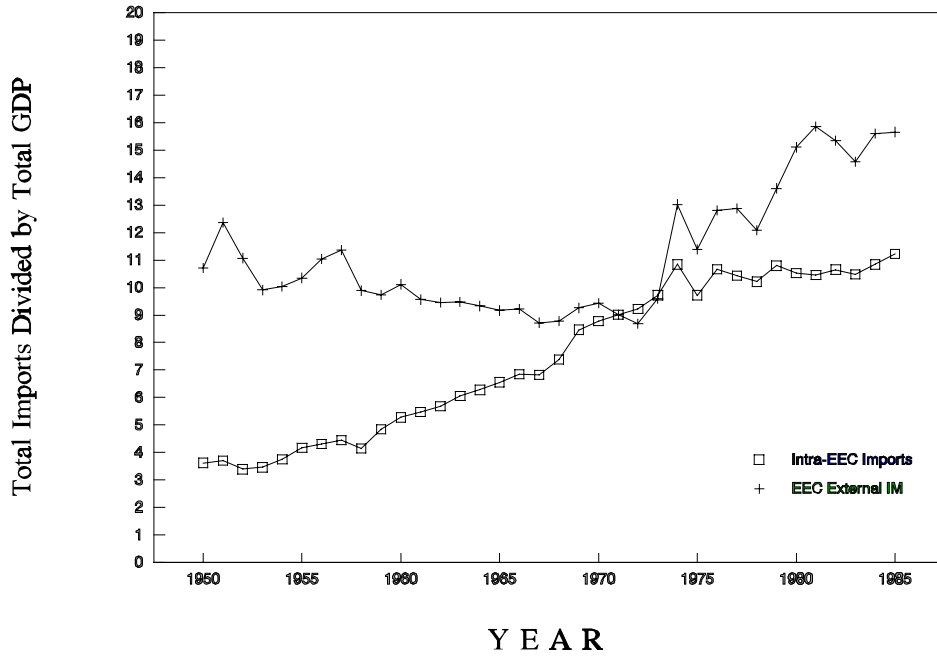
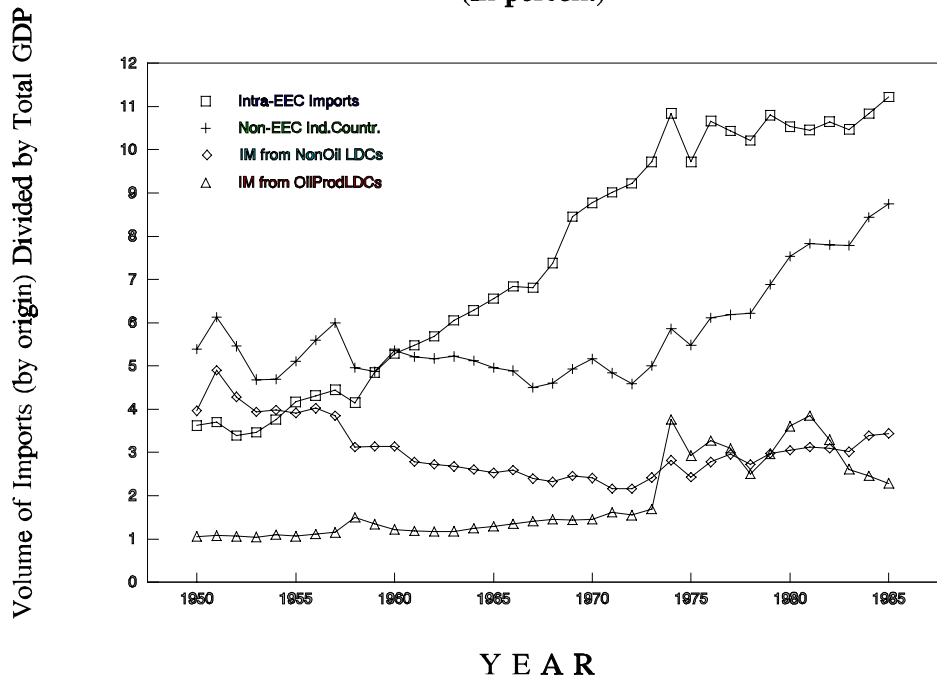


FIGURE IV

Origin of Imports, as a Percent of GDP

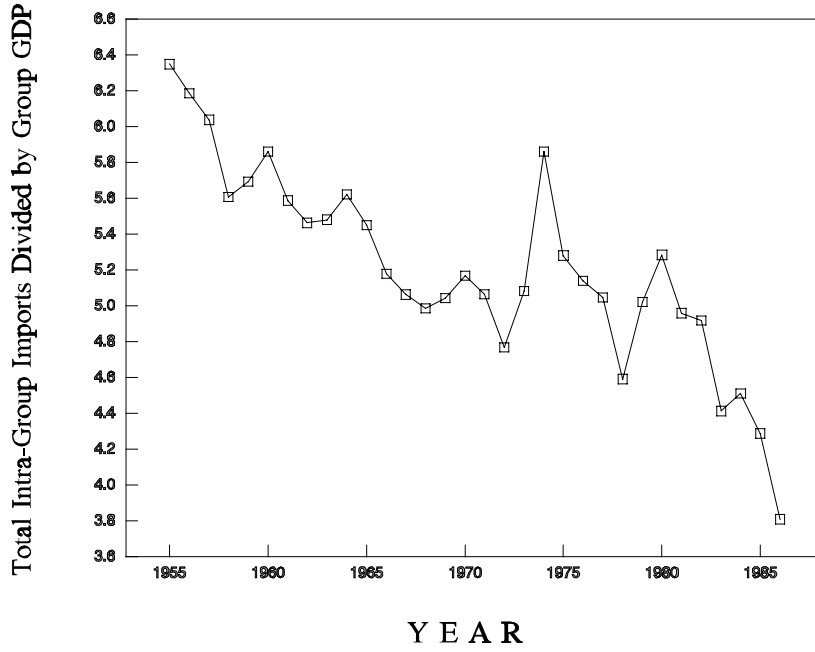
(in percent)



**FIGURE V**

**Ratio of Imports to GDP: Top 25**

(in percent)



**FIGURE VI**

**Ratio of Imports to GDP: Mid-14**

(in percent)

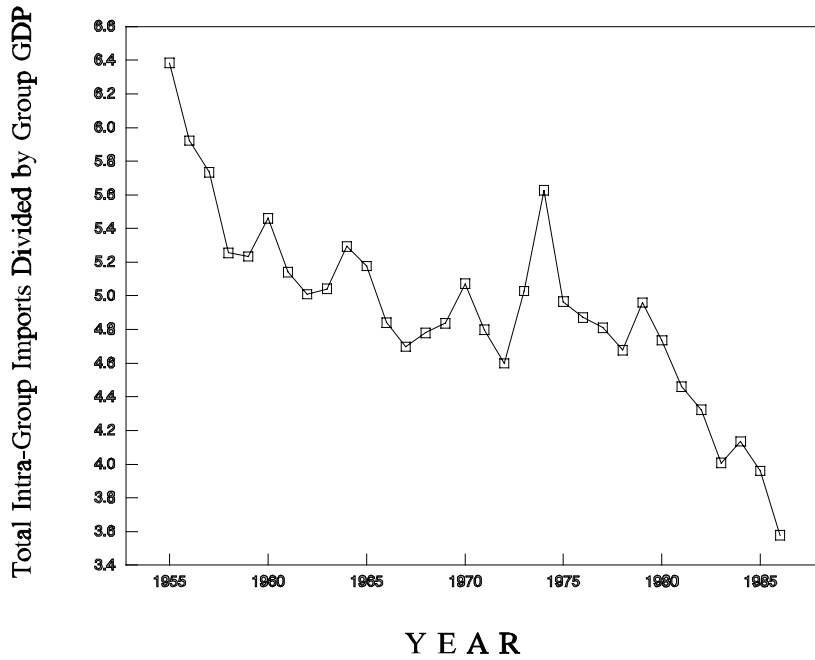


FIGURE VII

### Per Capita Income Dispersion

Between Belgium, France, Netherlands and Italy, 1870-1979

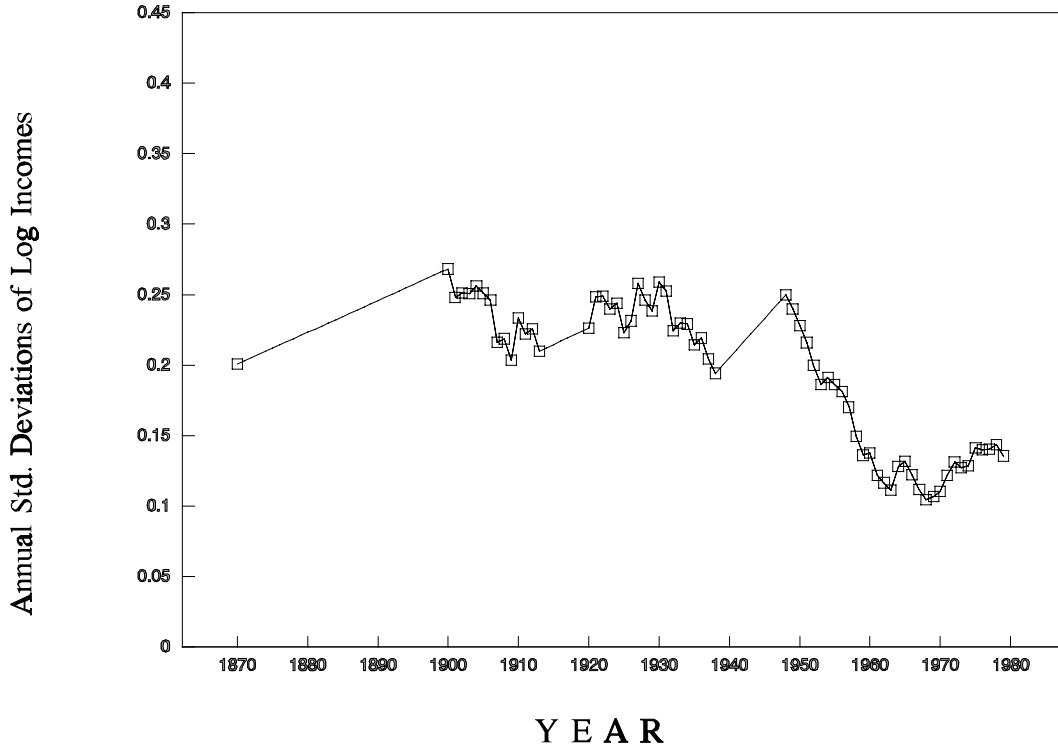


FIGURE VIII

### Per Capita Income Dispersion

Between the United Kingdom, Denmark, and Ireland, 1950-1985

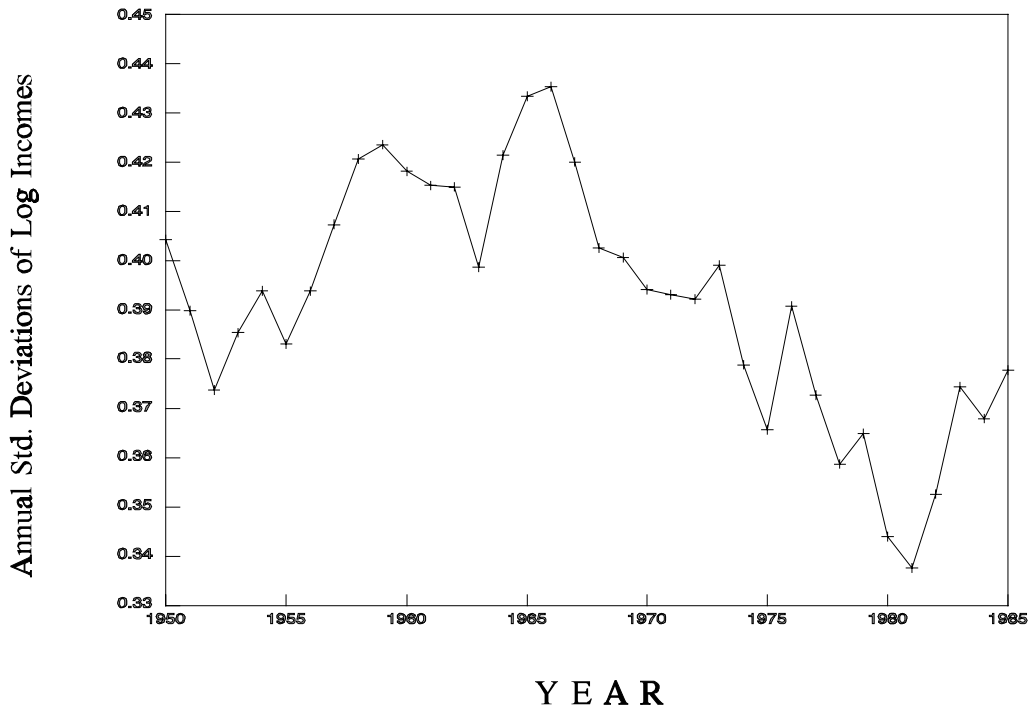


FIGURE IX

Comparison of Income Dispersions, 1929-1985

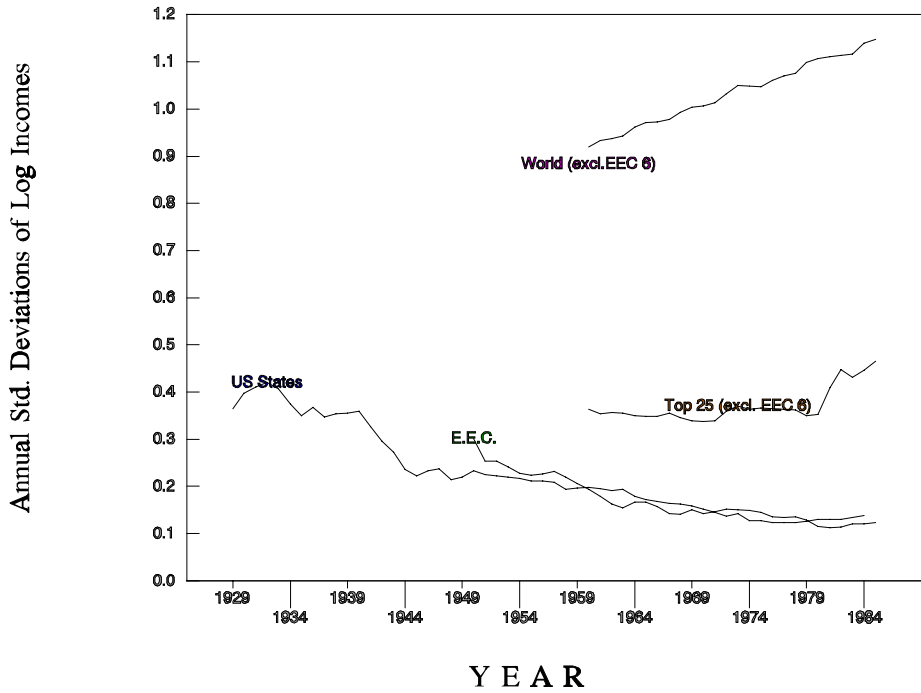
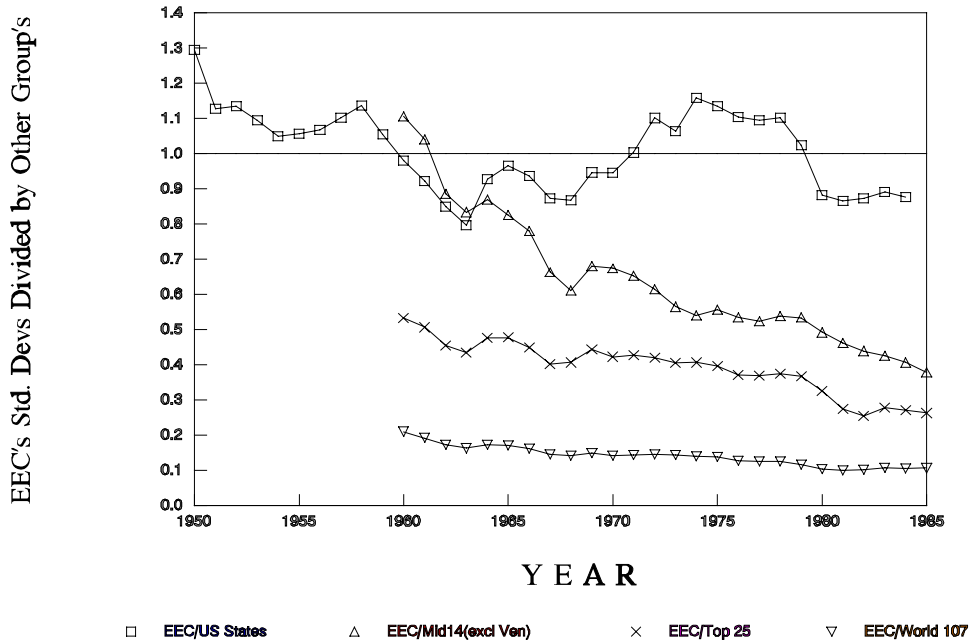


FIGURE X

Ratio of Disparity in EEC to Disparity in Other Groups  
(Relative Standard Deviations)



**TABLE I**  
**CONVERGENCE COEFFICIENTS, BY GROUP<sup>a</sup>**

	$\hat{\kappa}$	$N$	$R^2$	$t$ -stat. $H_0: \kappa=0$	Half Life	Double Life
<b><u>EEC</u></b>						
Prewar, <sup>b</sup> 1900-1933	0.0091 (0.0094)	135	0.988	0.98	75.5	
Postwar, 1951-1985	0.0291 (0.0066)	204	0.991	4.39**	23.5	
-----						
Transition Period 1959-1968	0.0506 (0.0103)	60	0.993	4.90**	13.3	
<b><u>UNITED STATES, 1931-1984</u></b>						
	0.0442 (0.0038)	2554	0.961	11.64**	15.3	
<b><u>WORLD (excl. EEC 6), 1960-1985</u></b>						
All 107 Countries	-0.0074 (0.0012)	2675	0.996	-6.42**		93.9
Top 25 Countries	-0.0027 (0.0056)	625	0.981	-0.47		260.9
-----						
14 Countries <sup>c</sup> (w/o Venezuela)	-0.0132 (0.0093)	325	0.973	-1.42		52.7

<sup>a</sup> Standard deviations are in parenthesis.

<sup>b</sup> Does not include Luxembourg due to lack of data and excludes the WWI years, 1914-1919.

<sup>c</sup> These are the 14 countries with the same per capita income range as the EEC 6 in 1960.

\*\* Significant at the one percent level.



FIGURE XI

**Tariff Elimination Schedules: 1958-1978**

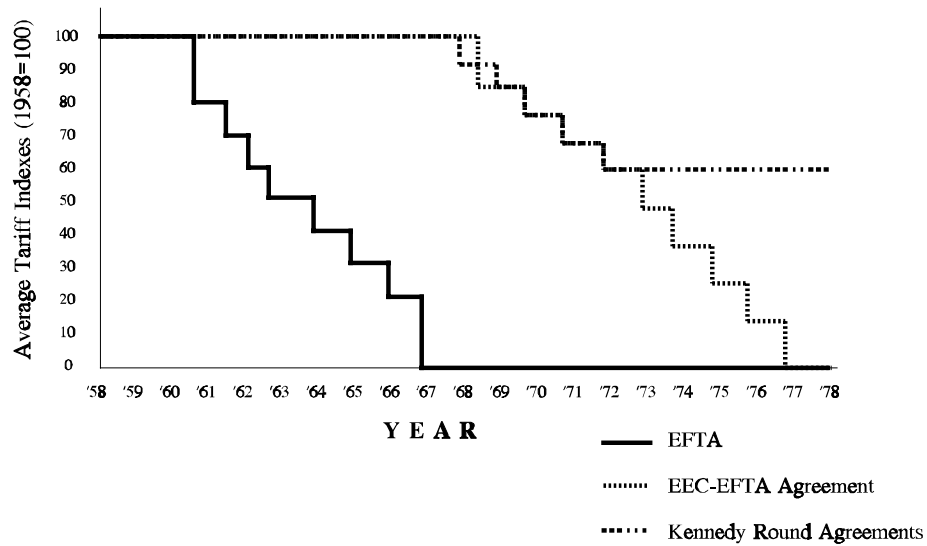


TABLE II

**Dates of Tariff Eliminations**

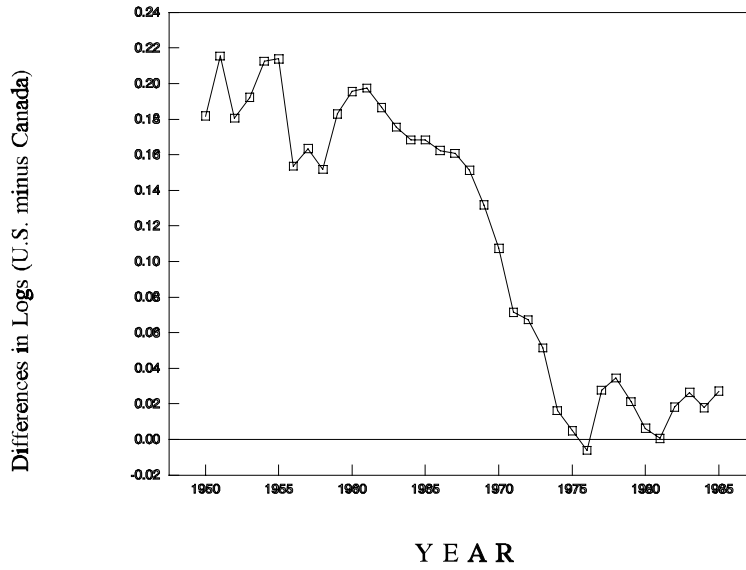
Avg. Tariff Index (in percent)	EEC	EFTA	EFTA-EEC Agreement*	Kennedy Round
100	1/58	1/58	1/58	1/58
92				1/68
90	1/59			
84			7/68	1/69
80	7/60	7/60		
76			1/70	1/70
70	1/61	7/61		
68			1/71	1/71
60	1/62	3/62	1/72	1/72
50	7/62	10/62		
48			4/73	
40	7/63	12/63		
36			1/74	
30	1/65	1/65		
24			1/75	
20	1/66	1/66		
12			1/76	
10	7/67			
0	7/68	1/67	1/77	

\* The first phases of this agreement were part of the Kennedy Round.

**FIGURE XII**

**Gap in Per Capita Incomes**

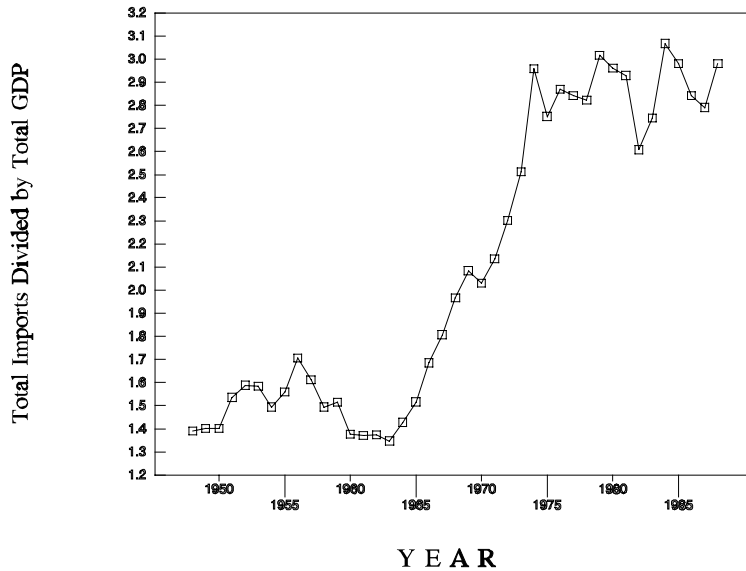
Between the United States and Canada, 1950-1985



**FIGURE XIII**

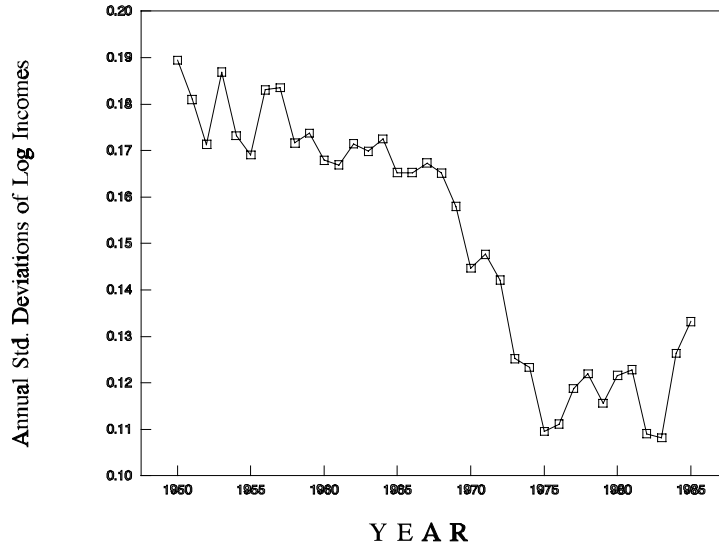
**Ratio of U.S.-Canada Bilateral Trade to GDP**

(in percent)



**FIGURE XIV**

**Per Capita Income Dispersion Among EFTA 6**  
Switzerland, Sweden, Denmark, Norway,  
Finland, and the United Kingdom



**FIGURE XV**

**Ratio of EFTA 6 Imports to EFTA 6 GDP:**  
Switzerland, Sweden, Denmark, Norway,  
Finland, and the United Kingdom



**TABLE III**  
**CONVERGENCE COEFFICIENTS IN POSTWAR, BY GROUP<sup>a</sup>**

Period	Group	$\hat{\kappa}$	Std.Dev.	<i>N</i>	<i>R</i> <sup>2</sup>	<i>t</i> -stat. <i>H</i> <sub>0</sub> : $\kappa=0$	Half Life	Double Life
<b><u>1951-1985</u></b>	EEC6	0.0291	0.0066	204	0.991	4.39**	23.5	
	EFTA6	0.0191	0.0097	204	0.981	1.98	35.9	
	US-Can <sup>a</sup>	0.0466	0.0240	34	0.980	1.95	14.5	
	EF6-EC6 <sup>b</sup>	0.0324	0.0091	204	0.976	3.58**	21.0	
<b><u>1951-1958</u></b>	EEC6	0.0248	0.0144	42	0.991	1.73	27.6	
	EFTA6	0.0142	0.0180	42	0.987	0.79	48.5	
	US-Can <sup>a</sup>	0.0565	0.0559	7	0.979	1.01	11.9	
	EF6-EC6 <sup>b</sup>	0.0456	0.0151	42	0.980	3.02*	14.8	
<b><u>1959-1967</u></b>	EEC6	0.0504	0.0118	48	0.993	4.28**	13.4	
	EFTA6	0.0097	0.0144	48	0.990	0.68	71.0	
	US-Can <sup>a</sup>	0.0155	0.0154	8	0.998	1.01	44.3	
	EF6-EC6 <sup>b</sup>	0.0166	0.0125	48	0.988	1.33	41.3	
<b><u>1968-1977</u></b>	EEC6	0.0107	0.0154	54	0.987	0.70	64.1	
	EFTA6	0.0540	0.0230	54	0.970	2.35*	12.5	
	US-Can <sup>ac</sup>	0.1855	0.0416	5	0.990	4.46**	3.4	
	EF6-EC6 <sup>b</sup>	0.0746	0.0247	54	0.958	3.02*	8.9	
<b><u>1978-1985</u></b>	EEC6	0.0216	0.0159	42	0.989	1.35	31.8	
	EFTA6	0.0028	0.0293	42	0.966	0.10	242.9	
	US-Can <sup>ad</sup>	0.2343	0.2298	11	0.526	1.02	2.6	
	EF6-EC6 <sup>b</sup>	-0.0242	0.0313	42	0.959	-0.77		29.0

EEC 6 includes Belgium, France, Netherlands, Germany, Italy and Luxembourg.

EFTA 6 includes Sweden, Switzerland, Finland, Norway, the United Kingdom and Denmark.

<sup>a</sup> The annual US-CAN data are gaps, rather than differences from a group mean as in the case of the other groups.

<sup>b</sup> The annual EF6-EC6 data are differences between each of the EFTA 6 incomes and the EEC 6 average income rather than from the EFTA average as in the EFTA 6 rows.

<sup>c</sup> Period: 1968-1973.

<sup>d</sup> Period: 1974-1985.

\*\* Significant at the 1 percent level.

\* Significant at the 5 percent level.