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TRADE LIBERALIZATION AND GROWTH: NEW EVIDENCE

Romain Wacziarg
Karen Horn Welch

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ABSTRACT

This paper revisits the empirical evidence on the relationship between economic integration and economic growth. First, we present an updated dataset of openness indicators and trade liberalization dates for a wide cross-section of countries in the 1990s. Second, we extend the Sachs and Warner (1995) study of the relationship between trade openness and economic growth to the 1990s, discussing recent criticisms of their measurement and estimation framework. Our results suggest that the cross-sectional findings of Sachs and Warner are sensitive to the period under consideration. In particular, an updated version of their dichotomous trade policy openness indicator does not enter significantly in growth regressions for the 1990s. Third, and most importantly, we present new evidence on the time paths of economic growth, physical capital investment and openness around episodes of trade policy liberalization. In sharp contrast to our cross-sectional results, we find that liberalization has, on average, robust positive effects on growth, openness and investment rates within countries. We illustrate these large sample findings with detailed case studies in a subsample of representative countries.

Romain Wacziarg
Stanford Graduate School of Business
518 Memorial Way
Stanford University
Stanford, CA 94305-5015
and NBER
wacziarg@gsb.stanford.edu

Karen Horn Welch
Institute for International Studies
Encina Hall
Stanford University
Stanford, CA 94305-6055
horn_karen@yahoo.com

1 Introduction

In recent decades, many developing countries have embarked on programs of external economic liberalization. Figure 1 shows that, in 1960, 15.6% of the countries in the world, representing 19% of its population, had open trade policies, in the sense defined by Sachs and Warner (1995). In 2000, a total of 73% of the countries in the world, representing 47% of the world population, were open to international trade.[1]

The effect of this trend towards greater trade policy openness on per capita income growth is the topic of a large body of research. Until recently, a growing academic consensus had emerged that both trade policy openness and higher ratios of trade volumes to GDP were positively correlated with growth, even after controlling for a variety of other growth determinants. Attempts to establish a causal link also suggested a positive impact of trade.[2] In a sweeping critical survey of this literature, Rodríguez and Rodrik (2000) have suggested that these findings are less robust than claimed, due to difficulties in measuring openness, statistically sensitive specifications, the collinearity of protectionist policies with other bad policies and other econometric difficulties. Because of the doubts that this study has created about the linkages between trade openness and growth, further research on this important topic is certainly called for.[3]

This paper takes over where Rodríguez and Rodrik left off. We pursue three goals. The first goal is to present an updated dataset on trade liberalization status and trade liberalization dates. While recent research has pointed to serious problems with the Sachs and Warner (henceforth, SW)

[1] The main reason for the discrepancy between the share of countries that are open and the share of world population living in open countries is that as of 2000, the world's two largest countries, China and India, remained essentially closed. Sachs and Warner (1995) classify India as open as of 1994. We revisited this issue and could not confirm their finding. In fact, China appears on many accounts to be twice as open, both in terms of policy indicators and in terms of trade volumes, than India. Both countries, according to our updated dates of openness, remained closed as of 2000. We discuss these case in detail below and in Appendix 2. For an in depth comparison of the trade regimes of India and China, see also Wacziarg (2003).

[2] Among this huge literature, note in particular the contributions of Edwards (1992), Dollar (1992), Ben David (1993), Sachs and Warner (1995), Ades and Glaeser (1999), and Alesina, Spolaore and Wacziarg (2000). Among studies trying to establish a causal link running from openness to growth or income levels, see Frankel and Romer (1999) where openness is measured by trade volumes and Wacziarg (2001), where openness is captured by a composite trade policy index.

[3] Harrison and Hanson (1999) also criticized the Sachs and Warner classification, in a spirit similar to that of Rodríguez and Rodrik. We revisit these criticisms in detail below.

classification, their classification of open and closed countries remains widely used in the literature on trade and growth, so an update is called for. Moreover, the underlying data on tariffs, nontariff barriers, exchange rate black market premia, socialist economic systems and export marketing boards can be of independent interest, and we provide a comprehensive database of these variables for the 1990s. We have painstakingly checked the Sachs and Warner classification of openness and updated their data on trade policy openness to 2000. The first contribution of this paper is therefore to present a comprehensive cross-country database of trade indicators such as tariffs, non tariff barriers and other measures of trade restrictions as well as policy liberalization dates for the 1990s.

The recent publication of updated PPP data on income levels (Summers, Heston and Aten, 2001) allows us to use these new data to update the Sachs and Warner empirical findings on trade policy and growth to 1998, and to revisit the Rodríguez and Rodrik (henceforth, RR) critique of this study. The second contribution of this paper is therefore to extend SW's empirical results on outward orientation and growth to the 1990s.

The third and most important goal of this paper is to exploit the timing of liberalization in a within-country setting. With almost fifty years of data, it becomes feasible to compare the performance of countries under a liberalized versus a non liberalized regime. We estimate the within-country response of per capita income growth, the investment rate and the ratio of imports plus exports to GDP to trade liberalization, controlling for time invariant country characteristics. Thus, the third contribution of this paper is to shift focus away from estimating the cross-sectional relationship between openness and growth, and to present new evidence on the within-country path of growth in relation to the date of major trade policy changes. The large sample evidence is supplemented by a case study discussion of the experience of several developing countries with trade reform.

Our cross-sectional results confirm recent criticisms of the SW findings by showing that they were sensitive to the chosen openness classification in the 1970-1989 period, and that they no longer hold for the 1990s. In the 1990s, a vast majority of the countries in our sample are classified as open, and a simple dichotomous indicator of openness no longer discriminates between slow and fast growing countries. Our findings suggest that researchers should exercise caution when using simple dichotomous policy indicators such as the SW dummy. However, we argue that the dates of trade liberalization, collected by SW from a comprehensive survey of a broad country-specific case

literature and updated by us to the late 1990s, can be used to estimate the within-country growth and investment effects of trade policy liberalization. In contrast to our cross-sectional findings, these new results based on within-country variation suggest that the effects of increased policy openness within countries through time are positive, economically large and statistically significant.

We then examine a subsample of developing countries for which we collected detailed information on the broader economic and political context of trade reform, and interpret our large sample results in the context of these country case studies. This reveals two lessons. First, there is a vast amount of heterogeneity across countries in the extent to which growth rose after trade reforms. While the average effect obtained in the large sample is positive, roughly half of the countries experienced zero or even negative changes in growth post-liberalization. Second, generalizations about the factors that may explain these differences are difficult to draw. The preexisting institutional environment of countries, the extent of political turmoil, the scope and depth of economic reforms, and the characteristics of concurrent macroeconomic policies all seem to have a role to play.

Our paper is organized as follows: in Section 2, we present our updated dataset of liberalization dates and policy openness indicators. In Section 3, we replicate the growth regressions in SW and update them to the 1990s. In Section 4, we present within-country evidence on trade liberalization, growth, investment and trade volumes, and discuss the timing of these effects. Section 5 discusses several detailed cases of trade liberalization in order to illustrate the country-specific complexities that underlie our large sample results. Finally, Section 6 concludes.

2 Trade Liberalization in the 1990s

2.1 The Sachs and Warner Criteria

SW constructed a dummy variable for openness based on five individual dummies for specific trade-related policies. A country was classified as closed if it displayed at least one of the following characteristics:

1. Average tariff rates of 40% of more (TAR);
2. Nontariff barriers covering 40% or more of trade (NTB);
3. A black market exchange rate that is depreciated by 20% or more relative to the official exchange rate, on average, during the 1970s or 1980s (BMP);
4. A state monopoly on major exports (XMB);

5. A socialist economic system (as defined by Kornai, 1992) (SOC).

SW selected the five criteria in order to cover various types of trade restrictions. They noted the obvious role of tariff and nontariff barriers in restricting trade. They argued that the existence of a black market premium on the exchange rate could have effects equivalent to a formal trade restriction. For example, if exporters have to purchase foreign inputs using foreign currency obtained on the black market, but remit their foreign exchange receipts from exports to the government at the official exchange rate, the black market premium acts as a trade restriction. Arguing on the basis of Lerner symmetry between import tariffs and export taxes, SW also included the state monopoly on exports criterion as a trade restriction. Finally, the socialist regime dummy variable was included in order to account for the trade-limiting aspects of centrally-planned economies.

It is important to distinguish the SW dummy variable, which pertains to the 1970s and 1980s, from the SW liberalization dates, which extend from 1950 to 1994 and were compiled independently using a rather different methodology. While the SW dummy was based on the five criteria discussed above, the dates of liberalization were obtained from a comprehensive survey of country case studies of liberalization. Whenever possible, the same criteria as those used to construct the cross-sectional dummy for the 1970s and 1980s were employed to establish a country's date of liberalization. However, data limitations and lack of consistency in the definitions of the available measures of trade restrictions across different time periods prevented SW from using their five criteria to establish the dates of liberalization.[4] In our update, we followed as closely as possible the methodology initially used by SW.

2.2 An Openness Dummy for the 1990s

2.2.1 Methodology

Our sample is based on the 118 countries included in the SW dataset, although they characterized the 1970-1989 openness status of only 111 of these. In addition, we gathered new data for the 23 Eastern European and newly independent states of the former Soviet Union that are included in the recently released Version 6 of the Penn World Tables (Summers, Heston, and Aten (2001)). In

[4] This is clearly stated in their footnote 44 (p.24): "Our choice of dating is surely subject to further refinement. (...) We relied on a wide array of secondary sources, which sometimes contradicted each other". Their Appendix described how they complied their dates of liberalization and the corresponding data sources in detail for each country in their sample.

order to maintain as much consistency as possible between the SW dataset and our update, we constructed our openness dummy variable (OPEN90-99) in the same way as theirs. Therefore, as was the case in SW, we constructed the dummy based on the five criteria described above. However, there were data limitations preventing us from updating their dummy to the 1990s decade based on exactly the same data. Our data sources are detailed in Appendix 1.[5] We merely describe the main differences here:

1). Due to data availability problems, we used unweighted tariff data, while SW used own-import weighted data. The unweighted average captures the simple average of *ad valorem* rates across tariff lines, while the weighted average is weighted by product shares in a country's overall imports. It is important to note this inconsistency between our dataset and the SW dataset, since countries that exceed the TAR threshold in our dataset based on unweighted data could conceivably not exceed the threshold based on weighted average data. Using partial data on weighted and unweighted tariffs from the World Bank, we argue in Appendix 1 that this is unlikely to be a problem: the use of unweighted tariffs as opposed to weighted tariffs does not result in countries being classified differently.

2). Nontariff barrier data comparable to that used by SW are hard to come by. They used average NTB data for 1985-1988 from the Barro-Lee dataset, itself based on UNCTAD data. Our NTB data covers only 29 countries, for the period 1995-1998. Whenever comparable data on NTBs was missing, we had no choice but to classify the countries based on the other four SW criteria only. Due to the limited availability of 1990s NTB data based on a consistent definition, we compiled additional NTB data, which might be independently useful to researchers. In addition to the 1995-1998 average core NTB data used in our analysis, our dataset contains 1989-1994 average core NTB data and 1999 data for all NTBs.[6]

3). SW relied on an export marketing index from a World Bank (1994) study of African countries as the basis for their XMB variables, and on the Kornai classification of Socialist states

[5] The full dataset compiled for this paper is available in electronic format at http://www.stanford.edu/~wacziarg/papersum.html. Appendix 2-A displays the data necessary to construct the updated 1990-1999 openness indicator.

[6] The difference in the definitions reflects the change in UNCTAD's reporting that occurred in 1999. Prior to 1999, UNCTAD reported core nontariff barrier frequency, which includes quotas, licensing, prohibitions, and administered pricing. In 1999, it began reporting all NTBs, which also include technical measures and automatic licensing, in addition to core NTBs.

as the basis for their SOC dummy. In the absence of updated indices from single sources, we could not employ exactly the same methodology. Therefore, in our classification the XMB and SOC dummies were both obtained from a comprehensive review of country case studies. In particular, the XMB criterion is no longer confined to African countries (as it was in SW), but applies to all countries in our updated data. We expanded the definition of an export marketing board to encompass any form of state monopoly over major exports.[7]

4). We lack data on the black market premium for several countries, as explained in detail in Appendix 1. BMP data from Easterly and Sewadeh (2002), our primary source for updating BMP data, is missing in the case of Belarus, Tajikistan, and Uzbekistan. We have very limited data for five other CIS countries (Armenia, Azerbaijan, Georgia, Kyrgyz Republic, and Moldova). All are classified as open based on the overall index that includes only this limited BMP data. In the case the former USSR states for which we do have BMP data, they are all closed on the basis of their BMP, with the exception of Latvia and Lithuania.

5). SW deviated in some cases from their self-imposed classification rules (as detailed on p. 66-67 of their paper). Some adjustments were meant to capture the fact that some countries had undergone changes in trade policy in mid-period only, so that a classification based on period averages could be misleading, while other adjustments were made, as the authors write, "for different reasons", detailed in their paper. Since we lack objective reasons to deviate from stated rules, we abstained from any such adjustments for the 1990-1999 openness dummy variable.

2.2.2 The Data

Appendix 2-A displays the underlying data used to construct the openness status dummy variable for the period 1990-1999. There are several noteworthy features of our data, highlighted in Tables 1 to 3. First, 46 countries, listed in Table 1, were classified as closed by SW in the 1970-1989 period and are now open in the 1990-1999 decade. Of these, 9 countries were still classified as closed by SW as of 1994 based on their dates of liberalization. Second, Table 2 lists 30 countries that were not classified in SW's study, including 23 Eastern European and former Soviet states.[8] 10 of them

[7] See Appendix 3 for further details on export marketing boards and political transitions from socialism along with their country-specific sources.

[8] The other 7 countries were Liberia, Cape Verde, Iceland, Lesotho, Malta, Panama, and Swaziland. On p. 66-67 of their study, SW state that these and 4 other countries were not classified due to lack of data. The 4 other countries they mention but neither list nor classify were Comoros, Fiji, Seychelles and Suriname. We did not have the necessary

remained closed in the 1990-1999 decade. Finally, of the 111 countries that SW had classified, 78 were closed and 33 were open in the 1970-1989 period, and we found that 32 were closed and 79 were open in the 1990-1999 period. Of the 141 countries that we classified, we found that 42 were closed over the 1990-99 decade, while 99 were open. There were no countries that were classified as open by SW in 1970-1989 and as closed according to our update in the 1990-1999 period.

An important and often overlooked drawback of the SW openness dummy variable is that it was based on averages of black market premium (BMP) data over each of two decades (1970–79 and 1980-89), averages of nontariff barriers (NTB) and tariffs (TAR) over the *last years* of their sample period (1985-1988) and on *end-of-period* data for the export marketing board dummy (XMB) and the socialist dummy (SOC). We chose to base the XMB and SOC variables on their 1999 values as opposed to beginning-of-period or decade-long data, in order to maintain as much consistency as possible with the SW methodology.[9] Similarly, our NTB data is available only for 1995-1998 (we do use decade averages of the tariff data, since they are available). As a result, some countries classified as closed could conceivably have become open late in the decade, and some open countries could have been closed over most of the period. Thus, decade dummies can only provide a rough characterization of a country's outward orientation, especially in a decade where many countries were actively engaged in liberalization. A preferable approach is to rely on liberalization dates, as we also do in our cross-sectional empirical work to address this drawback of the SW indicator.

2.3 Trade Liberalization Dates Since 1994

2.3.1 Methodology and Data

In addition to creating the OPEN90-99 dummy and classifying countries based on liberalization criteria for the entire decade, we also identified the year in which countries opened up. The liberalization date is intended to be the date after which all of the SW openness criteria are continuously met, although, as described above, data limitations often imposed reliance on country case studies of trade policy. Our choice of liberalization dates was based on annual tariff, nontariff,

data to characterize the openness status of these 4 countries during the 1990-1999 period.

[9] SW's XMB and SOC indicators were based on 1991 and 1987 data, respectively, so that employing 1999 data was consistent with their approach, however questionable the latter may be. The majority of countries that abolished export marketing boards throughout the 1990s did so during the first half of the decade, as shown in Appendix 2. However, relying on end-of-period SOC data means that some of the Eastern European countries and New Independent States of the former USSR are classified as open.

and black market premium primary data. In addition, a variety of secondary sources were utilized, particularly to identify the dates when export marketing boards were abolished and multiparty governance systems replaced the Communist Party's undivided rule. For several post-Communist economies, due to data limitations we relied, like SW, on the European Bank for Reconstruction and Development (1994) classification and their standards of openness.[10] Appendix 2-B presents the dates of trade liberalization, and Appendix 3 contains detailed country summaries of liberalization episodes, along with an explanation of the chosen dates.

Despite the clear criteria stated above, SW's dates of liberalization could not conform to their five formal criteria for openness, because comparable data was lacking for many time periods. Hence, there is much scope for disagreement with SW's classification, especially in light of new data published since their study. In our systematic review of the SW dates since 1990, we came to disagree with SW on the liberalization status or dates in the case of several countries.[11] Table 3 presents the dates of liberalization for 16 countries that were labeled as closed at the end of the SW sample period (1994), but liberalized between 1995 and 2001. In addition to these, the table displays data for Cape Verde and Panama, which were not classified in the SW study. Finally, there are five cases where we disagreed with the SW assignment of liberalization dates, as explained in Appendix 3.[12] Table 4 displays the 35 countries that remained closed as of 2001, including 5 countries that were not classified in the SW study and 4 countries for which we disagree with them, as explained in Appendix 3.[13] To summarize, out of 141 countries in our sample, 18 liberalized between 1995 and 2001 and 35 remained closed as of 2001.

2.4 The RR critique

RR found that the BMP and XMB variables played a major role in the classification of countries as open or closed. They state that a dummy variable for openness based on the BMP and XMB criteria alone leads to "a partition between closed and open economies that is much closer to that generated by OPEN [the SW dummy] than the partition generated by (the socialist country dummy, and the tariffs and nontariff barriers criteria alone)". Specifically, they showed that the BMP and

[10] See Appendix 3 for specific cases in which the EBRD (1994) opening dates were utilized.

[11] Previously, Wacziarg and Wallack (2003) had systematically checked the SW liberalization dates prior to 1990 in a subset of the SW sample, uncovering little disagreement.

[12] These 5 countries were Côte d'Ivoire, the Dominican Republic, Mauritania, Niger and Trinidad and Tobago.

[13] These 4 countries were Belarus, Croatia, Estonia and India.

XMB criteria generated a dummy variable that differed from the SW dummy in only 6 cases, while the TAR, NTB and SOC criteria used jointly generated a dummy variable that differed from the SW dummy in 31 cases. Hence, they argued that the SW dummy for the 1970-89 period reflected mostly the black market premium and the export marketing board criteria. Moreover, they argued that the latter reflected only African countries (many of which were classified as closed based on this criterion alone), and therefore amounted to an "Africa dummy".[14]

To what extent are our updated SW data subject to the RR critique? We found that BMP was the sole criterion on the basis of which 26 of our 42 countries were classified as closed in the 1990-1999 decade, while XMB was the sole criterion on which 9 countries were classified as closed. Moreover, 3 countries were classified as closed based on both the BMP and XMB criteria. Hence, only 4 countries were classified as closed based on the other three criteria. These were India, due its the level of tariff and nontariff barriers, and Pakistan, due to tariffs. Bangladesh was closed based on both the TAR and BMP criteria. China was classified as closed based on the BMP and SOC criteria. Based on the updated data, we found that the BMP and XMB criteria generated a dummy variable that differed from the 1990-1999 updated SW dummy in only 2 cases, while the TAR, NTB, and SOC criteria used jointly generated a dummy variable that differed from the updated SW dummy in 38 cases.[15] To summarize, our openness status dummy variable for 1990-1999 is subject to the same objections that RR placed against the SW classification for the 1970-1989 openness dummy.

The RR critique is valid not only in terms of countries' statuses based on the OPEN90-99 dummy, but also to some extent in terms of their liberalization dates. Since most countries were classified as closed based on the XMB and BMP criteria, not surprisingly when they opened up they did so when these variables changed. The BMP and XMB variables were the factors that determined the year of liberalization in many of the countries that opened up during the 1990s. The exceptions tend to be the Eastern European and New Independent States of the former USSR

[14] SW based the XMB criterion entirely on the World Bank (1994) study of African countries which had been involved in a World Bank or IMF structural adjustment program between 1987 and 1991. RR noted that SW classify all but one of the Sub-Saharan African countries as closed based on the XMB criterion, which is not applied to any other region. In contrast, we gathered and used XMB data for countries other than African ones.

[15] Of the countries in which the TAR, NTB, and SOC dummy and the updated SW dummy disagree, 20 are African and 10 are Eastern European or newly independent states of the former USSR. In other words, these were classified as closed based on either the XMB or the BMP criterion or both.

which opened based on the SOC criteria, i.e. general reforms related to the liberalization of their centrally-planned economies. We found that the tariff barriers criterion was not a decisive factor in assigning a liberalization date for any country and nontariff barriers were the determining factor only in the case of Panama. However, as we describe in considerable detail in Appendix 3, policy changes that reduced the BMP or removed XMBs were generally accompanied by changes in the levels of other types of trade barriers, such as tariff and nontariff barriers, which had initial values below the SW thresholds of 40%. Hence, liberalization dates do not simply capture changes in the BMP and XMB variables, but also reflect broader liberalization. Given that our dates of liberalization were cross-checked systematically against a case-study literature of reform in developing countries, we are confident that they reflect important shifts in trade policy.[16]

3 Trade and Growth Revisited

3.1 Updating the SW results in the cross-section

The SW study attracted considerable attention in part because the estimated effect of the cross-sectional dummy variable for openness in regressions explaining 1970-1989 growth was on the order of two percentage points of annual growth or more, a very large effect in magnitude. The release of updated PPP income data from the Penn World Tables version 6.0 (henceforth PWT6) and our updated data on trade policy openness make it possible to replicate the SW regressions up to the late 1990s.

For the sake of comparison with their paper, Table 5 replicates exactly the regressions in SW, for the period 1970-1989. The only difference is that we use PWT6 data instead of the previous release. As expected, the results are very much in accord with those in SW. The openness dummy for the 1970-1989 period enters highly significantly and with a magnitude of as much as 2.2 percentage points of annual growth, very much in line with the magnitude in SW.[17] As in SW, simple regressions

[16] A similar point was made in Wacziarg and Wallack (2003), who argued that the SW liberalization dates were good indicators of the timing of major trade policy changes, by thoroughly checking these dates against a case study literature of trade liberalization in a set of 25 developing countries.

[17] We also replicated the SW regressions using the openness status that would be obtained without the *ad hoc* reclassifications made by SW as described in Section 2.2.1, part 5 above and on p. 66-67 of the SW study. The results, available upon request, involved a smaller effect of this unadjusted SW dummy on growth - on the order of 1.8 points of annual growth at most.

of growth on initial income for the sample of open versus the sample of closed economies (columns 2 and 3) suggest that open economies tend to converge unconditionally, while closed economies do not.

Table 6 presents the results for the comparable regressions, for the 1990-1998 period, based on our updated openness indicator. Aside from the use of updated data, the regressions involve some minor differences in controls compared to the SW specification due to data related considerations. Specifically, we used the ratio of government consumption to GDP from PWT6 rather than the ratio of government consumption to GDP net of spending on the military and education, because we lack the latter data for the 1990s. Second, we used the number of revolutions per year rather than the number of revolutions and coups.[18] Finally, we used SW's own indicator of extreme political repression and unrest (POL), i.e. we did not update this variable for the 1990s (this variable is only entered in 2 out of 4 of the SW growth specifications and the coefficient on the liberalization indicator is not sensitive to its inclusion).

The main lesson from Table 6 is that the SW results break down completely for the 1990s. The openness dummy variable enters with a coefficient that is statistically indistinguishable from zero in regressions (4)-(7). Moreover, it is no longer true that the openness dummy can effectively partition countries among which absolute convergence is observed from those that diverge - in fact the signs are reversed, with open economies displaying divergence while closed economies display convergence. A noteworthy feature of these regressions is that the 1990s data features 78 open countries and 27 closed economies. This is in sharp contrast with the 1970-89 openness classification, which featured 31 open countries and 74 closed ones. Clearly, the updated openness indicator can no longer effectively partition fast growing from slow growing countries.

A potential argument is that what constitutes an open country differs in the 1990s compared to earlier periods. For example, in a context where most countries have already opened up to trade, even moderate barriers can effectively isolate a country from the world economy. In other words, perhaps the SW criteria for openness are not stringent enough for the 1990s. However, if we make it harder for countries to be classified as open by reducing the SW thresholds for the TAR and

[18] Using the number of revolutions and coups is actually a mistake, although a frequent one in the cross-country literature on political instability. These data come from Arthur Banks' cross national time series database. "Coups" describe successful revolutions, while "revolutions" describe any attempt to overthrow the government, successful or not. Summing the two amounts to double counting successful revolutions.

NTB variables to 20%, and the BMP threshold to 10% (while keeping the XMB and SOC criteria unchanged), we find that the open countries actually grow *slower* than closed ones (the estimated effect being statistically significant at the 10% level). Hence, a partitioning of countries based on more stringent criteria for openness in the 1990s does not restore the Sachs and Warner findings.[19] A distinct possibility is that the classification of countries as "open" or "closed" is too crude to provide much explanatory information for growth in a simple cross-section.

3.2 Date-based openness indicators

An alternative and arguably better way to estimate the cross-sectional effect of openness on growth is to construct openness indicators based on the dates of liberalization. For example, the openness status for 1980 takes on a value of 1 if a country has liberalized by 1980, and a value of 0 otherwise. Subsequent growth (post 1980) can then be regressed on this variable and other controls. We constructed dummy variables for each decade in our sample in this fashion - one for 1970, one for 1980 and one for 1989. An advantage of this method over the period-specific dummy variables is that the latter are based partly on information from the end of the period (the NTB, SOC, TAR and XMB criteria), and partly on period averages (BMP). Hence, some countries might only have become open late in the period, leading to a possible bias in the estimated effect of openness. Constructing openness indicators based on the dates of liberalization avoids these inherent problems of the SW classification methodology by isolating only those countries that were open at the beginning of a period.

Tables 7 presents the results using our date-based indicators, for three separate decades. The specifications are identical to those in SW, restricting the time span of each regression to a single decade. The results are consistent with the observations made in the previous subsection. The effect of the liberalization status in the 1970s is weaker and smaller than in the 1980s, but positive and significant at the 90% level. Columns 3 and 4 show that the SW results were likely driven by the

[19] These results are available upon request. When we decrease the threshold criteria for TAR and NTB to 20% and BMP to 10%, there were 25 more countries classified as closed. 13 of these were closed on the basis of TAR (either solely or jointly), 6 based on NTB, and 11 based on BMP (several countries are classified as closed for multiple reasons). There is much heterogeneity among the countries that are reclassified on the basis of these more stringent crteria. For example, certain countries which experienced rapid growth during the period, or at least prior to 1997 (for example. Korea and Thailand) are considered closed based on the more stringent criteria. Other larger economies (such as Brazil) are also classified as closed. The group of closed countries also includes a number of African countries.

strong effect of the liberalization status in 1980 on growth in the 1980s. Finally, the effect is positive but statistically indistinguishable from zero in the 1990s, when countries are partitioned according to their liberalization status as of 1989. Hence, the results presented earlier were not driven by the fact that the cross-sectional openness dummy relies on averaged or end-of-period data. Moreover, they were not driven by possible misclassifications of countries due to minor differences in the way we updated the SW dummy to the 1990s (as described above in subsection 2.2.2), since the 1989 openness status is based entirely on SW's own data. We conclude that SW's cross-sectional findings are highly sensitive to the decade under consideration.

3.3 Random effects results

Another advantage of the date-based indicators is that they allow us to treat our data as a panel, and thereby to exploit potential efficiency gains resulting from panel data estimation methods. We constructed a panel with three periods (1970-1979, 1980-1989 and 1990-1998) in order to estimate the effects of the openness indicator on growth over a longer span of time. We use a flexible form of the random effects estimator which is often used in the cross-country literature (see Barro and Sala-i-Martin (1995), chapter 12). This allows efficiency gains through the estimation of cross-period error covariances. Our estimator is based on the Seemingly Unrelated Regressions (SUR) framework: we first formulated one equation per time period, constrained the coefficients on each regressor to equality across periods, and ran SUR on the resulting system of three equations.

The results are presented in Table 8. The estimated coefficient on the liberalization status dummy is statistically significant and lies between 1.2 and 1.4 annual percentage points of growth, depending on the specification, for the period 1970-1998 overall. This estimate is smaller than that obtained in a pure cross-section by SW for 1970-1989, but larger than that obtained above for the 1990-1998 period. In fact, Table 9, which runs the specification with the complete list of control variables using SUR, but without constraining the coefficients to equality across periods, shows that the estimated effect of the openness indicator is essentially zero for 1990-1998, and was driving down the overall effect in the constrained regressions of Table 8. Similarly, the effect of liberalization for the 1980s (and to a lesser extent for the 1970s) drove the overall positive effect in Table 8. These SUR results are therefore consistent with the findings obtained from period by period regressions, as discussed in subsection 3.1.2.

To summarize, exploiting the panel dimension of the data does not change our basic result that

the SW liberalization status is conditionally uncorrelated with growth for the 1990s.

4 Within-Country Liberalization Dynamics

As we argued above, a cross-sectional dummy variable based on the SW criteria is likely to be a poor measure of trade policy orientation. We have outlined the data limitations associated with this method, and confirmed objections first proposed by RR. We have also shown that an updated dummy for the 1990s was conditionally uncorrelated to economic growth across countries, so that the results in SW were specific to their chosen time period. In this section, we argue that better use can be made of the data on dates of liberalization. With almost fifty years of data on growth and openness, it becomes possible to assess the within-country effects of discrete changes in trade policy openness.[20] In what follows we will compare the means of economic growth and other variables of interest such as physical capital investment rates and trade volumes under a liberalized versus a non-liberalized regime.

4.1 Liberalization and Growth

To assess the within-country effect of growth on liberalization, we ran fixed-effects regressions of growth on a binary liberalization indicator, defined by the dates of liberalization. The regressions amount to difference regressions in growth, or difference-in-difference regressions in log income:

$$\log y_{it} - \log y_{it-1} = \alpha_i + \beta LIB_{it} + \varepsilon_{it} \tag{1}$$

where y_{it} is per capita income, $LIB_{it} = 1$ if t is greater than the year of liberalization and no reversal of the trade policy reforms have occurred, 0 otherwise. Table 10 shows that, in our sample, 31.7% of country-year observations occur in a liberalized regime (the sample period is 1950-1998).

[20] SW, p. 57-59, also presented some within country evidence on liberalization and growth for a restricted sample of 37 reformers. They presented estimates for one fixed-effects regression of growth on dummy variables for three time periods around liberalization episodes. They showed growth was depressed by 0.88 percentage points in the three years prior to a liberalization, increased on average by 1.09 percentage points annually in the three years following liberalization, and increased by 1.33 points thereafter (all relative to growth in years preceding 3 years before liberalization). These limited results are of the same order of magnitude as our more detailed findings. We thoroughly investigate the robustness of these estimates, extend them in time (our sample period spans 1950 to 1998 rather than 1966-1993) and space (our sample includes up to 133 countries rather than 37) and present new evidence on investment and openness, none of which SW did.

The conditional mean of annual growth of per capita GDP given that a country is liberalized is 2.71%, while the mean is 1.18% in a non-liberalized regime (a difference of 1.53 points of annual growth). Note however that these simple conditional means are based on both cross-sectional and within-country variation. To isolate the within-country variation, Table 11 displays fixed-effects regressions of growth on the liberalization indicator. The univariate regression for 1950-1998 indicates that the within-country difference in growth between a liberalized and a non-liberalized regime is 0.56 percentage points. While all time invariant country characteristics are held constant in this regression, it may be the case that growth rates vary systematically through time. Similarly, periods of openness tend to follow periods of isolation, rather than the reverse, so that the LIB_{it} indicator could also be correlated with time. To correct for the possible bias this would introduce, we added a trend or year dummies to the regression (both are expected to generate similar results). The effect of LIB_{it} on growth is now raised to magnitudes in line with the unconditional mean difference of 1.53 points. These coefficients are estimated with great statistical precision.

In all specifications the estimated within-country effect actually rises through time, and is maximized for the 1990s decade. This stands in sharp contrast with the cross-sectional results presented above: countries that liberalized in the 1990s experienced a larger post-liberalization increase in growth than countries that liberalized in any other decade. Indeed, the estimated difference in growth for the 1990s is roughly 2.5 percentage points in the specifications that include a time trend or year dummy variables, and is even larger when these controls are omitted.

4.2 Liberalization and Investment

The empirical literature on trade and growth suggests that the effects of liberalization on economic growth are mediated largely by the rate of physical capital investment. Several authors, for example Levine and Renelt (1992), Baldwin and Seghezza (1996) and Wacziarg (2001) have suggested that investment rates are the main channel linking trade and growth. This finding is based largely on cross-country findings. To investigate this issue in our within-country context, we can run fixed-effects regressions of investment rates on the liberalization indicator:

$$\frac{I_{it}}{Y_{it}} = \eta_i + \phi LIB_{it} + v_{it} \tag{2}$$

where I_{it} is physical capital investment and Y_{it} is GDP in country i at time t.

Table 12 reports the estimates of such regressions. Our new within-country evidence confirms past cross-country findings. On average, a country in a liberalized regime experiences a rate of

physical capital investment that is between 1.2 and 1.9 percentage points higher than in a non-liberalized regime, for the period 1950-1998. This represents between 13% and 20% of this variable's standard deviation in the pooled sample. The effects seem largest in the initial period of the sample (1950-1970), and declined in the 1980s and 1990s (although they remain positive and statistically significant when a trend or year effects are included).

To get a rough notion of how much of the effect of trade policy openness on growth can be attributed to the investment channel, we ran fixed-effects regressions of growth on the investment rate. Table 13 reports the results from these regressions. The coefficient on investment in the baseline 1950-1998 regression (column 3) is 0.151%. In turn, the effect of liberalization on investment in the corresponding regression of Table 13 is 1.937 points. Multiplying the two together, the effect of liberalization on growth via investment is estimated to be roughly 0.292. This compares to a total effect of liberalization on growth of 1.417 percentage points (Table 11). Hence, by this rough calculation the investment channel accounts for 21% of the effect of liberalization on growth. This is less than the channel effect uncovered in some cross-sectional studies. Wacziarg (2001), for instance, attributed 50% of the effect of trade policy openness on growth between 1970 and 1989 to the investment channel. This may be because the effect of liberalization on investment has fallen through time, so that incorporating the 1990s into the analysis reduced the average effect of liberalization through this channel. It may also be due to the estimation of the effect using within-country variation exclusively, rather than cross-sectional variation. Whatever the reason for the smaller channel effect, our analysis does provide suggestive evidence that investment constitutes an important channel whereby trade-centered liberalization affects growth within countries.

4.3 Liberalization and Openness

Next, we examine whether trade policy liberalization is followed by a break in the volume of trade, measured by the ratio of imports plus exports to GDP. If this is the case, it provides an indication that the policy we label "liberalization" raised actual the level of openness of the economy. This is important because announced reforms may be poorly implemented or counteracted by the enactment of alternative trade barriers. For example, the removal of non-tariff barriers in India over 2000-2001 was accompanied by a flurry of phytosanitary measures and antidumping filings which effectively kept imports of "sensitive" items out. If trade liberalization were associated with increases in trade volumes, we could be more confident that it actually raised the level of exposure of

the reforming country to the world economy. To examine this issue, we ran the following regression:

$$\frac{X_{it} + M_{it}}{Y_{it}} = \nu_i + \delta LIB_{it} + w_{it} \tag{3}$$

where X_{it} denotes exports and M_{it} denotes imports. Table 14 presents the results. Clearly, since the level of openness rises through time in almost all countries irrespective of liberalization, the appropriate econometric specification involves the inclusion of either a time trend or of period-specific dummy variables (second and third panels of Table 14). Our evidence suggests that liberalization raises openness by roughly 5 percentage points of GDP when considering the full sample period 1950-1998. However, this effect is indistinguishable from zero in the 1990-1998 time period. This may be due to the fact that, for countries that liberalized in the 1990s, there are too few years of data since liberalization to observe a break in the growth of trade volumes. Still, we do observe growth effects of liberalization in this decade. For most periods, however, trade liberalization as we define was associated with sustained and large increases in the effective level of exposure of the reforming country to the world economy.

4.4 Timing of the Effects

The simple average difference between growth in a non-liberalized regime and growth in a liberalized regime may mask interesting timing issues. For example, it provides no information on how soon the effects occur, or on whether they may cease to be felt after a few years following reforms. In this subsection, we examine the time path of growth, investment and openness for an average country before and after liberalization.

Figures 2 through 4 present the sample average growth rate, investment rate and openness ratio, respectively, for twenty years before and twenty years after a liberalization. Since several countries had varying numbers of years of data before and after their specific liberalization, these averages at each point in time are based on different samples of countries (a problem we address below).[21] However, they are quite informative. First, despite the fact that we are controlling for neither a time trend nor for year effects, the increase in growth post-liberalization is remarkably similar to that obtained in Table 11 - growth before trade-centered reforms averages 1.5% and rises to roughly 3% post-reforms. Second, there does not seem to be a strong time pattern - the effects seem quite immediate and do not die out after a few years. It does seem that the few years immediately

[21] We removed from the sample countries that never experienced liberalizations, as well as those that experienced policy reversals and/or multiple liberalizations.

preceding a liberalization are low-growth years, but as discussed above this fact does not bias the coefficients estimated in Table 13.

Figures 3 and 4 confirm our previous observations. The investment rate seems to "take-off" during the 10 years that follow a liberalization, and thereafter remains high. The plotted effect seems larger than that uncovered in the regressions, perhaps because of the somewhat different sample. Openness (Figure 4) follows a more or less linear trend upward, without an apparent break at the date of liberalization. However, our more formal tests based on fixed-effects did reveal an effect attributable to liberalization, even after controlling for a trend or for time dummies.

The fact that the sample of countries used to compute each year's average values of these variables varies across years may introduce some bias in these pictures. To account for this, we isolated 39 countries for which we have growth, investment and openness data for 8 years before and after liberalization.[22] One drawback is that we now have only 8 rather than 20 years around liberalization, and that the sample may include many early liberalizers and therefore be less representative. Nonetheless, the plots displayed in Figures 5, 6 and 7 are remarkably similar to those in Figures 2, 3 and 4, reinforcing our confidence in our results.

To further examine the timing of the growth, investment and openness responses to liberalization, we defined dummy variables for four (non-overlapping) periods surrounding the reforms. We then ran-fixed effects regressions of growth, investment and openness on these four dummy variables. The specification was as follows:

$$\log y_{it} - \log y_{it-1} = \alpha_i + \beta_1 D_{1it} + \beta_2 D_{2it} + \beta_3 D_{3it} + \beta_4 D_{4it} + \varepsilon_{it} \tag{4}$$

where $D_{1it} = 1$ if $T - 3 \leq t \leq T - 1$ and zero otherwise, $D_{2it} = 1$ if $T \leq t \leq T + 2$, $D_3 = 1$ if $T + 3 \leq t \leq T + 6$, and $D_4 = 1$ if $t > T + 6$. The coefficients on these dummy variables capture the average difference in growth between these years and the period preceding 3 years before liberalization (which is the baseline period). We ran the corresponding specifications for the investment rate and openness ratio, and the results are presented in Table 15.[23]

[22] These 39 countries were Australia, Austria, Belgium, Benin, Botswana, Chile, Colombia, Cyprus, Denmark, Finland, France, The Gambia, Ghana, Guinea, Guinea-Bissau, Guyana, Hungary, Indonesia, Ireland, Israel, Italy, Japan, Jordan, South Korea, Luxembourg, Mali, Mauritius, Mexico, Netherlands, New Zealand, Paraguay, Philippines, Poland, Spain, Sweden, Taiwan, Tunisia, Uganda and Uruguay.

[23] We had to drop countries which experienced policy reversals or multiple liberalizations, for which the definitions of the dummy variables are not straightforward. This reduced our sample from 133 to 118 countries.

The results are consistent with the observations made from Figures 2-4. In the baseline specification of column (3), growth is depressed by 0.55 percentage points in the three years before liberalization, compared to preceding years. In the three years following liberalization, growth rises slightly (by 0.30 percentage points), but this effect is statistically indistinguishable from zero. In $T+3$, sustained growth differences become noticeable - with increases in growth of 1.44 points in period $T+3$ to $T+6$, and of 1 percentage point after that, relative to the baseline period. To summarize, the typical timing pattern revealed by these regressions is one where pre-liberalization growth is slightly depressed, and growth is raised in the years that follow two years after the reforms by anywhere between 1 and 1.5 percentage points. A similar pattern applies to investment and openness. Of course, these estimates reflect the sample average, and may mask interesting country-specific differences, which we discuss in Section 5.

4.5 Concurrent Events and Policies

Our analysis above is subject to two important caveats, which we now address. First, economic or political crises may be precursors of policy reform, which could depress growth and investment rates in the period immediately preceding reforms, biasing our estimates upwards. Second, trade reform is often associated with other types of external and domestic reforms, such as capital market liberalization, domestic deregulation, etc., in which case we might wrongly attribute to trade reforms the effect of these other policy changes. In what follows we address these two potential limitations of our analysis.

4.5.1 Concurrent Events

Countries that liberalize often do so following periods of economic turmoil. Tornell (1998) showed that most (60%) episodes of economic reform, including trade reform, occur in the aftermath of a domestic political or economic crisis. In this case, pre-reform growth could be depressed due to other factors and we could wrongly associate post-reform changes in growth rates to the reforms per se. To account for this possibility, Table 16 presents fixed-effects results that exclude the year of liberalization (columns 1-3) as well as the three years surrounding the year of liberalization (column 4-6). These results are not sensitive to the number of years excluded - they were little changed when we excluded 5 years around the liberalization date, for instance.[24]

[24] These results are available upon request.

Surprisingly, the estimated difference in growth between the liberalized and now-liberalized regimes is *raised* slightly when we exclude the year of reform or the three years around it. The orders of magnitude remain in line with the estimates discussed earlier - anywhere between 0.6 and 1.5 percentage points of annual growth, depending on the specification. This robustness check increases our confidence that our estimates are not driven by the economic and political turmoil that often immediately precedes liberalizations.

4.5.2 Concurrent Policies: The Scope of Reforms

Another important caveat is that trade liberalization may go hand in hand with other types of domestic reforms. For instance, countries carrying out programs of trade reform often enact at the same time policies of domestic deregulation and privatization, other microeconomic reforms and macroeconomic adjustment. In such a context, it is simply wrong to interpret the coefficient on liberalization in a within-country growth regression as the total effect of trade liberalization *per se*.[25] A more realistic interpretation of our estimates is that they capture the impact of trade-centered reforms more broadly. It is difficult to directly address this point unless a significant fraction of our sample carried out trade reforms in isolation from other reforms.

Fortunately, we can distinguish countries that carried out overall reforms from those that carried out external sector reforms in relative isolation from other domestic reforms. Wacziarg and Wallack (2003) discussed 25 episodes of trade liberalization occurring mostly in developing countries and predominantly in the 1980s. 14 of these were accompanied by market-oriented domestic reforms, while 8 episodes were characterized as "pure" trade reforms (which occurred in isolation from major shifts in domestic policy) and 3 involved active counteraction of external sector reforms through programs of domestic subsidization to import competing industries. The distinction between pure trade reforms and overall reforms was based mostly on whether the countries implemented a substantial program of privatizations at the same time as trade reforms. We isolated a sample of 21 countries that were part of the Wacziarg and Wallack (2003) study, and that were classified either as "trade reformers", or as "overall reformers".[26] We then examined whether the within-country

[25] This is related to an analogous point often made in a cross-country context. Some observers, for instance RR, have suggested that "bad" government policies tend to go together, so that it is hard to disentangle the effects of trade policy from those of poor macroeconomic management, poor governance or poor institutions in general.

[26] We excluded India from this list as India had not liberalized in the sample period according to the criteria of the current paper (in Wacziarg and Wallack (2001) India was classified as having opened in 1994, based on different

effects of liberalization on growth differed between trade reformers and overall reformers.

Our results are presented in Table 17. There are several noteworthy features of these results. First, despite the fact that we are restricting our attention to 21 of our 133 countries, the estimates for the pooled sample of 21 countries are remarkably similar to those obtained with the full sample. For instance, the effect of liberalization on growth in the reduced sample is 1.585 in our baseline specification (that which includes both country and year effects, column 3), compared to a corresponding figure of 1.417 in the full sample (Table 11, column 1, bottom panel). This reinforces our confidence in the robustness of our findings and also suggests that our sample of 21 is representative of the broader sample.

Second, the estimate of the impact of trade liberalization for those countries that carried out trade reforms in isolation are commensurate with the corresponding estimates for those countries that also reformed their domestic sectors, despite the crude nature of the distinction between overall reformers and pure trade reformers. Admittedly, the coefficients are estimated with less precision (although the coefficient on the liberalization dummy is significant at the 90% level), but this is likely due to the small sample of "pure trade" reformers (7 countries, or 331 observations). A plausible conclusion based on these suggestive results is that the effect of trade centered reforms is in large part attributable to its external reform component. We further discuss this issue in Section 5, in the context of individual country experiences.

4.5.3 Concurrent Policies: Other External Reforms

Trade reforms are sometimes associated with other types of external reforms, such as capital market liberalization. To the extent this is the case, our estimates may capture the impact of these financial reforms rather than trade reforms. This argument is frequently invoked to criticize the difference estimates presented above. We can directly assess the merits of the claim that external financial liberalization is concurrent with trade liberalization by looking at data on the timing of financial reforms.

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criteria). Our results were not affected by the inclusion or exclusion of India. Additionally, we excluded the three countries classified as "counteractors", since results based on only 3 countries are not likely to be very meaningful. Separate results for counteractors are however available upon request. Our sample consisted of Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Ghana, Guatemala, Hungary, Kenya, Mexico, Morocco, New Zealand, Paraguay, Poland, Spain, Sri Lanka, Trinidad & Tobago and Uruguay.

Bekaert, Harvey and Lunblad (2001) examine the impact of capital market liberalization on economic growth in a panel context, using both cross-sectional and within-country time variation, finding robust positive effects of financial liberalization. To obtain this result, they use data from Bekaert and Harvey (2000) on the dates of official regulatory reforms pertaining to financial markets.[27] We use their dates and compare them to our own dates of trade liberalization.

Out of the 106 countries that had liberalized by 2001 in our sample of 141, Bekaert and Harvey (2000) characterize the date of official financial liberalization for 40 countries.[28] Of these, only 2 countries (Brazil and Turkey) have exactly the same year of official financial regulatory reform and trade liberalization. Moreover, only 9 countries implemented financial sector reforms within 3 years before and after the date of trade liberalization, and 17 did so within 5 years before and after. Many countries never enacted financial liberalizations, but did enact trade reforms, so the numbers cited above overstate the extent of coincidence between financial and trade liberalization dates. In summary, there is little reason to believe, contrary to common claims, that trade reform and financial market liberalization are concurrent, and therefore that our estimates might confound the effects of both types of reform.

5 Individual Country Cases

The results presented above summarize the effect of trade liberalization on growth and other variables for a sample of very diverse countries. Fixed-effects allow us to control for all time-invariant country characteristics, but on the other hand our estimated coefficients on liberalization are not country-specific, and merely represent the average response. The reaction of different countries to reforms is likely to be different, especially since the depth and scope of reforms differed across countries. In fact, we show in what follows that there is considerable heterogeneity in the response of growth to trade reform. Much can be learned from this variation. In this section, we examine specific cases of reforms in countries that are representative of our broader sample, and for which we observe enough data on growth, investment and openness before and after reforms. The goal is to get a sense of the intricacies of reform in specific cases, and to illustrate the economic mechanisms that give rise to the average effects described above. We first examine the time paths of growth,

[27] Henry (2003) also presents data on economic and political reforms for a smaller set of 18 developing countries. We use some of his data in discussing specific country cases in Section 5 below.

[28] This comparison between the Bekaert and Harvey (2000) dates and our own is available upon request.

investment and openness for a subsample of 24 developing countries for which we have at least 8 years of data on either side of the liberalization date, and then turn to a more detailed discussion of reforms in 13 of those countries.

5.1 Country-Specific Effects

Figures 8 and 9 present 24 individual country plots of the 3-year moving average of per capita income growth against time. We started from the sample used to create figures 5, 6 and 7, i.e. the 39 countries for which we have at least 8 years of data on either side of the date of liberalization. Among those, we further restricted attention to emerging markets, the main focus of this study.[29] There is tremendous variation in growth rates in these countries, and the 3-year moving average does not dampen these fluctuations sufficiently for a very clear picture to emerge.[30] However, horizontal lines representing average growth before and after liberalization reveal positive growth effects in 13 of 24 countries, and negative effects in 6 countries. The remaining 5 countries exhibited an effect close to zero, as further illustrated in Table 18. A few noteworthy cases where large post-liberalization growth effects appear quite clearly are Ghana, Guinea, Mauritius, Poland and Taiwan. In most other cases the variation in growth precludes a clear visual analysis of country-specific cases.

Table 18 presents the mean change in growth, openness and investment rates for this sample of 24 countries, providing a perhaps clearer picture of those that experienced significant increases in growth. Within those that experienced positive effects, the magnitude of the growth increase ranged from 0.86 percentage points of per capita income growth in Poland to 3.62 points in Mauritius. The range of growth declines, among the 6 affected countries, was of a similar amplitude. Below, we discuss some possible reasons for this cross-sectional variation in growth effects.

Figures 10 and 11 present the time path of the investment rate around liberalization and Figures 12 and 13 do the same for openness, for the same set of 24 countries. Table 18 summarizes the

[29] These 24 countries are Benin, Botswana, Chile, Colombia, Cyprus, Ghana, Guinea, Guinea-Bissau, Guyana, Hungary, Indonesia, Israel, Jordan, South Korea, Mali, Mauritius, Mexico, Paraguay, the Philippines, Poland, Taiwan, Tunisia, Uganda and Uruguay.

[30] Increasing the number of years over which the moving average is calculated would dampen the distinction between growth under a liberalized regime liberalization and growth under a non-liberalized regime for the years around liberalization. We have replicated these pictures with a 5-year moving average and they looked quite similar. Figures 2 and 5 or the fixed-effects results presented above are of course a much better way to summarize the average relationship linking liberalization to growth than country specific graphs.

before and after comparison for these variables. Investment rates and openness exhibit considerably more time persistence than per capita income growth and it is therefore easier to get a clear visual picture of country experiences. There are again large variations across individual countries. The post-liberalization surge in investment rates is particularly clear for Chile, Colombia, Hungary, Indonesia, Jordan, Korea, Poland and Taiwan. The break in the openness series is particularly apparent for Chile, Colombia, Cyprus, Ghana, Hungary, Jordan, Korea, Mauritius, Poland and Taiwan.

To summarize, a closer examination of post-liberalization changes in growth, investment and openness for a restricted sample of developing countries reveals a considerable amount of heterogeneity in these countries' experiences with reform. In what follows, we turn to a series of case studies to try to develop hypotheses that could account for these differences.

5.2 Discussion of Specific Country Cases

From the sample of 24 developing countries for which we have at least 8 years of data on either side of liberalization, illustrated in Figures 8 to 13, we have selected a smaller sub-sample of 13 countries in order to carry our more detailed case studies. Our goal here is to choose a sufficiently small set of countries so that we can describe in some detail their preexisting conditions, overall policy environment and macroeconomic circumstances, while maintaining a geographically diverse sample reflecting the range of country specific growth effects identified above. Ultimately, we seek to uncover patterns that could explain cross-country differences in individual countries' responses to liberalization.

The subsample was selected in order to represent a geographically diverse set of countries having experienced different growth effects of liberalization, in roughly the same proportions as the 24 countries discussed in Section 5.1. It includes 13 countries, 7 of which experienced higher post-liberalization mean growth rates. These are Poland, Ghana, Uganda, Taiwan, Chile, Korea, and Indonesia. In the case of two countries, Colombia and the Philippines, liberalization had roughly zero effect on their mean growth rates. The growth effect of liberalization was negative in 4 countries included in the sub-sample: Hungary, Mexico, Botswana, and Israel. To highlight the overall policy context existing in these countries around the time of reforms, Appendix 4 describes in detail their concurrent reforms, macroeconomic environment and political context, and this description serves as the basis for the generalizations we now seek to draw. Based on our case

analysis of this sub-sample of countries, several observations can be drawn.

Sustained Reforms. In the case of the majority of countries having experienced higher growth post liberalization, trade reforms were not strictly limited to the period of liberalization. Rather, these countries continued to deepen trade reform after the time of liberalization. For example, after liberalizing in 1963 and 1968, respectively, Taiwan and Korea continued to lower tariffs and remove NTBs, particularly during the mid-1980s and 1990s. In the case of Chile, which liberalized in 1976, it recovered from the Latin American debt crisis and continued to grow during the late 1980s. During this period, it furthered trade liberalization through decreasing tariffs and implementing several bilateral free trade agreements. In Uganda, the 1988 liberalization was followed by a second wave of external reforms in 1993-1994. Finally, Indonesia also sustained the initial reforms of 1970 with a reductions in export duties in 1976 and further trade-centered liberalization throughout the 1980s.

The Scope of Reforms. As detailed in Section 4.5.2, whether trade reforms were part of a package of other domestic reforms or occurred in relative isolation does not seem to help predict their effect on growth. Our case study analysis may reveal clues as to why this is the case. With respect to the scope of reforms, these cases reveal the considerable complexity of this issue.

Among countries that implemented broad-based reforms, and where post-liberalization growth increased, Chile and Poland stand out as prototypical success stories of reform. Both implemented broad-based domestic reforms of which trade liberalization was only a part. On the other hand, countries such as Hungary, Mexico and Colombia were classified as broad-based reformers by Wacziarg and Wallack (2003), but average growth post-liberalization was actually lower. In the case of Hungary, this may be because the domestic portion of the reform program (banking sector reforms, privatizations) was in large measure delayed until 1995. Hence, to the extent that external and domestic reforms are complementary, we may not observe the full effects in our growth data for Hungary, which extends only to 1998. The case of Mexico is more complex. In Mexico, the privatization program began before trade liberalization, in 1984, with the sale of medium and small businesses, and continued after 1986 with the sale of larger enterprises such as the national telephone company, elements of the banking industry and national airline. While Mexico maintained large government oligopolies that prevented broad industrial restructuring and resource reallocation, one can hardly argue that its entry into GATT in 1986, and the concurrent reduction in

external barriers, occurred in isolation from other domestic reforms. Finally, we suggest below that political instability is probably at the heart of Colombia's lack of a post-liberalization growth increase.

The flip-side of this coin is a country like Ghana, which according to Wacziarg and Wallack (2003) implemented trade reforms in relative isolation (privatization for instance did not begin until the early to mid 1990s), and did experience a 2 percentage point increase in mean growth after the 1985 liberalization. Other interesting cases are the success stories of Southeast Asia. There, many countries implemented policies aimed at increasing foreign direct investment around the time of liberalization (as in Taiwan and Korea) at the same time or after external liberalization. However, our three Southeast Asian examples (Indonesia, Taiwan and Korea) pursued growth strategies involving widespread government involvement in the economy. In Indonesia, government involvement increased during the 1970s, after external liberalization was begun. As is well-known, South Korea and Taiwan both adopted activist industrial policies where the government was involved in "picking winners". Until the Asian crisis of 1998, the growth performance of these South East Asian countries was historically unprecedented. Their experience shows that governmental disengagement from the economy is not a necessary condition for successful trade reforms. What all these countries shared was an outward-oriented development model where increasing exports was a central pillar of the growth strategy.

Hence, as we suggested earlier in the paper, one cannot point to the breadth of reform as an unambiguous criterion explaining differences in the growth response to liberalization. The picture that emerges from our analysis of the scope of reforms is far from simple. In particular, broader reforms should not be confused with government disengagement from the economic sphere. The set of countries having experienced higher post-liberalization growth includes such diverse countries as Korea, Taiwan and Indonesia on the one hand - countries that maintained heavy government involvement in the economy - and Poland and Chile on the other hand - countries that actively reduced the role of government in the economy. Similarly, the set of countries that experienced negative or zero growth differentials after liberalization includes Mexico, Hungary and Colombia - countries that actively disengaged the government from domestic economic activity at the time of trade reforms.

Counteractive Policies. Some of our 13 countries implemented policies that actively *counteracted* the effects of trade reform, and as a result did not experience increases in growth rates.[31] For instance, in Israel social pacts based on broad coalitions of labor, government, and industry set the patterns for prices, wages, and the exchange rate in ways that mitigated the effects of trade openness on domestic producers. In the Philippines, trade liberalization was accompanied by a large increase in the share of state-owned enterprises (SOEs) in the economy, including a doubling of the share of financial flows from the government to SOEs in GDP between 1987 and 1989. Such interventions, in part designed to protect domestic producers in the face of increased import competition, precluded the realization of the gains from trade.

Macroeconomic Factors. Countries that did not experience growth increases after liberalization often suffered from various mitigating circumstances, associated in particular with restrictive macroeconomic policies. In Hungary and Mexico, two countries with lower post-liberalization growth, trade reform was followed by tight monetary policies involving high interest rates, with a depressing effect on growth. Currency overvaluation also often acts to undo the effects of trade liberalization, as was the case in Mexico in the late 1980s and early 1990s.

The case of Botswana is also interesting. While generally considered an African success story, Botswana did not experience a surge in growth post-liberalization. In fact, Botswana's growth rate prior to liberalization was, according to Table 18, roughly 2 percentage points higher than after liberalization. The start of diamond mining in 1971 is often given credit for Botswana's high level of subsequent economic performance. Volatility on world diamond markets increased shortly after Botswana implemented trade reforms, in 1979. In particular, the country experienced a recession in 1981-1982, as a result of the weak world diamond market. Thus, terms of trade considerations are essential in accounting for the absence of a post-liberalization growth surge in Botswana.

Political Instability. Several countries suffered from severe forms of political instability which prevented the realization of the gains from trade liberalization. A prime example in our sample of 13 is Colombia, where instability persisted throughout the 1990s. Other examples include the Philippines and Israel. In contrast, countries which seem to have experienced higher growth post reforms have also witnessed periods of relative political stability. Taiwan is a case in point, and so are Korea, Indonesia and Chile, where liberalization coincided roughly with the rise to power

[31] Some of these cases are discussed in greater detail in Wacziarg and Wallack (2003).

of authoritarian regimes, resulting in a degree of lasting political stability after periods of political unrest.

To summarize, the packaging and timing of reforms is important to explain differences in post-liberalization growth patterns. Countries that followed through by deepening trade reforms over time, did better. Active governmental disengagement from industrial policy, and broad based reforms were not necessary conditions for success. Countries that counteracted a short-lived program of external liberalization with domestic interventions did worse, as did countries that experienced tight macroeconomic policies, unfavorable terms of trade shocks and political instability.

6 Conclusion

This paper introduced an updated dataset of trade policy indicators and liberalization dates. We revisited the evidence on the cross-country effects of SW's simple dichotomous indicator of outward orientation on economic growth, confirming the pitfalls of this indicator first underlined by RR. Additionally, we showed that the partitioning of countries according to the SW dichotomous indicator, while it effectively separates fast growing countries from slow growing ones in the 1980s and to a lesser extent in the 1970s, fails to do so in the 1990s. Simple dichotomous indicators of outward orientation are too crude to capture the complexities of trade policy.

However, this paper suggests that liberalization dates, capturing episodes of discrete shifts in trade policy, can be useful to estimate the within-country response of growth. We have painstakingly checked and updated the SW dates of liberalization, relying both on quantitative data and on a thorough review of country-specific case studies of reform. We presented new and robust evidence that these dates of liberalization characterize breaks in growth, investment and openness series within countries. Over the period 1950-1998, countries that have liberalized their trade regimes have experienced, on average, increases in their annual rates of growth on the order of 1.5 percentage points compared to pre-liberalization times. The post-liberalization increase in investment rates was between 1.5 and 2 percentage points, confirming past findings that liberalization works to foster growth in part through its effect on physical capital accumulation. Finally, liberalization raised the trade to GDP ratio on average by roughly 5 percentage points after controlling for a time trend, suggesting that episodes of trade policy liberalization did indeed raise the actual level of openness of liberalizers. In a within-country sense, then, trade-centered reforms do have significant effects on economic growth.

While these within-country estimates based on a wide sample represent the average effect of liberalization on growth, investment and openness, they mask interesting differences in the individual response of countries to trade liberalization. We have examined these individual responses country by country. Restricting ourselves to a sample of 13 developing countries, we have compiled case study data that might shed light on the sources of these differences. On the one hand, countries that experienced positive effects tended to deepen trade reforms. Yet active industrial policies such as those implemented in South East Asia did not preclude growth gains from trade liberalization, and broad-based reforms appear to be neither a necessary nor a sufficient condition for reaping these gains. On the other hand, countries that experienced negative or no effects on growth tended to experience political instability, contractionary macroeconomic policies in the aftermath of reforms or to actively counteract trade reform by shielding domestic sectors from necessary adjustments. Future research should seek to further identify factors accounting for heterogeneity in the growth effects of trade reform.

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APPENDIX 1

A. Source and description of the Trade Openness Data

Variable	Description	Dates	Sources	Comments
Wacziarg-Welch Variables				
Tariffs (TAR)	Average of unweighted average tariffs Dummy = 1 if TAR > 40%	1990-1999	UNCTAD (2001) World Bank (2000) WTO (various trade policy reviews)	• MFN ad-valorem rates based on the harmonized system of trade codes (HS) at the 6-digit industry level. • Both the UNCTAD and World Bank data are compilations of data from various sources. • All tariff data are unweighted except Croatia and Moldova in which the TAR data represent average weighted as opposed to unweighted tariffs due to lack of unweighted data. • Countries that exceed the TAR threshold in our dataset based on unweighted data could conceivably not exceed the threshold based on weighted average data. Some indication of how frequently this occurs can be gleaned from World Bank data on weighted and unweighted tariffs available for two years since 1990 for 71 developing countries. The years for which this World Bank data are available vary from country to country, but one of the dates was typically in the first half of the 1990s and the other in the second half. The correlation between the weighted and unweighted series was greater than 97%. Furthermore, there were no cases where the unweighted tariff was smaller than 40% and the weighted tariff was greater than 40%. There were three cases (China in 1992, Brazil in 1989 and Zimbabwe in 1996) where the weighted tariff was smaller than 40% while the unweighted tariff was greater than 40%. Of these, China and Zimbabwe are classified as closed by us based on the black market premium criterion. Brazil is classified as open because the post-1990 unweighted tariff data averages 17.32%, but data on weighted tariffs for 1999 shows a value of 12.6%, making it highly unlikely that the average weighted tariff rate over the 1990s exceeded 40%. To summarize, the use of unweighted tariffs as opposed to weighted tariffs likely does not result in any country being classified differently.
Non-Tariff Barriers (NTB)	Average of core non-tariff barrier frequency on capital goods and intermediates. Core non-tariff barriers include quotas, licensing, prohibitions, and administered pricing Dummy = 1 if NTB > 40%	1995-1998	Michalopoulos (1999)	• The NTB frequency reflects the % of products subject to NTBs, but not their degree of restrictiveness • Core NTBs exclude technical measures and automatic licensing, which are included in All NTBs • UNCTAD data is reported as Core NTBs prior to 1999 and All NTBs after 1999. Due to this definitional change, historical data is not available in UNCTAD (2001) and one cannot average the frequency of NTBs for the entire period of 1990-1999. • Our NTB data is extremely limited. Michalopoulos (1999) is the most comprehensive source we could locate. However, it is limited to developing countries, thereby excluding all of Western Europe and North America. It

Variable	Description	Dates	Sources	Comments
				includes the 1989-1994 NTB averages and 1995-1998 averages. We relied on the data from 1995-1998. However, the dataset only contains data for 29 countries and is missing data for 112 countries in our dataset. In the case of the countries with missing data, they are classified as open on the basis of the NTB criterion. 50 the countries for which we are missing data are classified as open on the basis of the OPEN90-99 criteria AND are NOT Western European or North American (regions which we assume have NTBs < 40%.)
Black Market Premium (BMP)	Period average of annual BMP: [(Parallel market exchange rate/ official exchange rate)– 1] * 100 Dummy = 1 if BMP > 20%	1990-1999	Easterly, William and Mirvat Sewadeh (2000)	• The primary source of BMP data used by SW (Cowitt, 1986, *World Currency Yearbook)* has not been updated to include the entire period of 1990-1999. We rely on data from Easterly and Sewadeh (2002), which is a compilation of various sources. While this appears to be the most comprehensive source available, its coverage is limited. • BMP data from Easterly and Sewadeh (2002), our primary source for updating BMP data, is lacking for the following countries: Belarus, Tajikistan, and Uzbekistan. We classified Uzbekistan as closed on the basis of its dual exchange rate regime. Belarus is closed on the basis of other criteria, however, Tajikistan is classified as open, but is missing BMP, TAR, and NTB data. • In the case of five other CIS countries, (Armenia, Azerbaijan, Georgia, Kyrgyz Republic, and Moldova, we have very limited data. Based on the Easterly and Sewadeh (2002) data, the BMP was 0 in 1999 in all these countries. However, there are no other data points for the entire decade (1990-98). Based on this limited BMP data (and missing TAR and NTB data), all five are all classified as open in 1990-1999.
XMB	Dummy = 1 if country maintained an export marketing board or similar monopoly on exports	1999	IMF Country Reports (various issues) WTO Trade Policy Reviews (various issues)	• Includes all countries - NOT limited to strictly African countries, as in SW • We chose to base the XMB variable on countries' 1999 status for two reasons: first, this is consistent with the SW XMB variable which was based on 1991 status (near the end of their period), second, the majority of countries that abolished export marketing boards did so during the first half of the decade[1]
SOC	Dummy = 1 if the Communist Party maintained undivided power	1999	IMF Country Reports (various issues) Economist Intelligence Unit	• Definition of a Socialist state is that employed by Kornai (1992) which was the basis of the Sachs Warner dummy • We chose to base the SOC variable on countries' 1999 status for two reasons: first, this is consistent with the SW SOC variable which was based 1987 status (near the end of their period), second, the Eastern European and New Independent States of the former USSR opened based on the SOC criterion during the early 1990s.

[1] See Appendix 3 for dates and more specific information.

APPENDIX 1

SW Variables				
Variable	**Description**	**Dates**	**Sources**	**Comments**
Tariffs (TAR)	Own-import weighted average tariff rate on capital goods intermediates Dummy = 1 if TAR > 40%	1985-88	UNCTAD data from Barro and Lee (1994)	
Non-Tariff Barriers (NTB)	Average own-import weighted nontariff frequency on capital goods and intermediates. Includes licensing, prohibitions, and quotas. Dummy = 1 if NTB > 40%	1985-88	UNCTAD data from Barro and Lee (1994)	
Black Market Premium (BMP70 and BMP80)	Period average of annual BMP: [(Parallel market exchange rate/ official exchange rate)– 1] Dummy = 1 if either BMP70 OR BMP80 > 0.2	BMP70 = 1970-1979 BMP80 = 1980-1989	Cowitt (1986) with updates from World Bank data (supplied by Ross Levine).	
XMB	Dummy = 1 if country was included in the World Bank (1994) study and scored a 4 on the study's export marketing index in 1991.	1991	World Bank (1994)	World Bank (1994): *Adjustment in Africa: Reforms, Results, and the Road Ahead* was limited to African countries that had been involved in a World Bank or IMF structural adjustment program between 1987 and 1991.
SOC	Dummy = 1 if classified as socialist in Kornai (1992, table 1.1)	1987	Kornai (1992)	
OPEN	Dummy = 1 for all open countries Dummy = 0 if a country scored a 1 on any of the above: TAR, NTB, BMP70, BMP80, XMB, OR SOC			The following adjustments were made to the OPEN dummy, as discussed (Sachs Warner, 1995, pp. 66-67) • Morocco, South Africa, Haiti, and New Zealand were changed from Open to Closed • The following were assigned "missing" values due to insufficient data: Lesotho, Swaziland, Cape Verde, Comoros, Liberia, Iceland, Fiji, Malta, Panama, Seychelles, and Suriname

APPENDIX 1

B. Sources and description of the variables used in the regressions

Cross-sectional Regressions (Section 3)	
GROWTH	Real per capita growth rate of GDP per year: e.g.: G7089 = [ln(GDP89) - ln(GDP70)]/19. Periods: 1970-1989, 1970-1980, 1980-1989, 1989-1998. Source: Heston, Summers and Aten (2002).
LRGDPCH	Real GDP per capita in (1996 international prices) Source: Heston, Summers and Aten (2002).
LIBER_SW_1970-89	Openness indicator for 1970-1989. See the text for an explanation of its construction. Sachs and Warner (1995).
LIBER_SW_xx	Cross-sectional openness indicator constructed from Sachs and Warner's liberalization dates, for xx=1970, 1980, 1989.
LIBER_WW_1990-99	Openness indicator for 1990-1999, constructed by Wacziarg and Welch. See the text for an explanation of its construction.
POL	Composite dummy variable indicating extreme political repression and unrest. Source: Sachs and Warner (1995)
SEC	Secondary school enrollment rate, 1970, 1980, 1985. Source: Barro and Lee (1994).
PRI	Primary school enrollment rate, 1970, 1980, 1985. Source: Barro and Lee (1994).
GVXDXE	Ratio of real government "consumption" spending net of spending on the military and education, to real GDP, averaged 1970-1984 Source: Barro and Lee (1994).
CG	Ratio of real government consumption expenditures to real GDP, for periods 1970-1980, 1980-1989, 1989-1998. Source: Heston, Summers and Aten (2002).
REVCOUP	Number of revolutions and coups per year, averaged over period, 1970-85. Source: Barro and Lee (1994).
REVOL	Number of revolutions per year, averaged over the periods 1970-1980, 1980-1989, 1989-1998. Source: Banks (2001).
ASSASS	Number of assassinations per million population per year, averaged over the relevant period, 1970-85, 1970-1980, 1980-1989, 1989-1999. Source: Banks (2001)
PPIDEV	The deviation of the log of the price level of investment (PPP investment divided by exchange rate relative to the United States) from the cross-country sample mean in 1970. Source: Heston, Summers and Aten (2002).
INV	Ratio of real gross domestic investment (public and private) to real GDP, averaged over the period 1970-89. Source: Barro and Lee (1994) who, in turn, used Heston, Summers and Aten (2002).
DENSI	Population (in thousands) divided by land area (in square meters), 1960, 1970, 1980. Source: Heston, Summers and Aten (2002) (population data) and CIA World Factbook (land area)
Fixed-Effects Regressions (Section 4)	
GROWTH	Real per capita growth rate of GDP per year (annual data). Source: Heston, Summers and Aten (2002).
INVESTMENT	Investment rate. Source: Heston, Summers and Aten (2002).
OPENNESS	Ratio of imports plus exports to GDP. Source: Heston, Summers and Aten (2002).

APPENDIX 2-A
Data on Trade Policy

WB Code	Country	OPEN90-99[1] 1 = Open; 0 = Closed	Avg. Tariff (%)[2] 1990-1999 (average)	Core Non-Tariff Barriers (%)[3] 1995-1998 (average)	Black Market Premium (%)[4] 1990-1999 (average)	Export Marketing Board[5]	Socialist[5]
ALB	Albania	1	15.9		7.53	0	0
DZA	Algeria	0	23.97		177.91	0	0
AGO	Angola	0			23.62	0	0
ARG	Argentina	1	12.54	2.10	9.30	0	0
ARM	Armenia	1			0.00	0	0
AUS	Australia	1	7.91		0.00	0	0
AUT	Austria	1	6.91		0.00	0	0
AZE	Azerbaijan	1			0.00	0	0
BGD	Bangladesh	0	43.70		83.27	0	0
BRB	Barbados	1	15.58		2.31	0	0
BLR	Belarus	0	12.63		n/a	1	0
BEL	Belgium	1	6.91		0.00	0	0
BEN	Benin	1	28.61	1.00	1.93	0	0
BOL	Bolivia	1	10.34		1.49	0	0
BWA	Botswana	1	20.55		7.82	0	0
BRA	Brazil	1	17.32	21.60	13.76	0	0
BGR	Bulgaria	1	17.37		7.44	0	0
BFA	Burkina Faso	1	29.13		1.98	0	0
BDI	Burundi	0	7.40		29.55	0	0
CMR	Cameroon	1	18.43		1.98	0	0
CAN	Canada	1	6.81		0.00	0	0
CPV	Cape Verde	1	22.05		0.00	0	0
CAF	Central African Republic	0	12.80		1.55	1	0
TCD	Chad	0	15.80		1.98	1	0
CHL	Chile	1	11.33	5.20	9.84	0	0
CHN	China	0	31.06		35.89	0	1
COL	Colombia	1	14.30	10.30	8.87	0	0
ZAR	Congo, Dem. Rep.	0	25.47		34.67	1	0
COG	Congo, Rep.	0	17.97		1.98	1	0
CRI	Costa Rica	1	10.60	6.20	5.37	0	0
CIV	Cote d'Ivoire	1	22.00	30.90	1.98	0	0
HRV	Croatia	0			37.76	0	0
CYP	Cyprus	1	10.64	21.60	2.16	0	0
CZE	Czech Republic	1	6.08		0.22	0	0
DNK	Denmark	1	6.91		0.00	0	0
DOM	Dominican Republic	1	16.70	6.20	16.31	0	0
ECU	Ecuador	1	11.29		9.34	0	0
EGY	Egypt, Arab Rep.	1	30.23		12.45	0	0
SLV	El Salvador	1	9.38	5.20	13.59	0	0
EST	Estonia	0	1.12		25.09	0	0
ETH	Ethiopia	0	22.55		111.43	0	0
FIN	Finland	1	6.91		0.00	0	0
FRA	France	1	6.91		0.00	0	0
GAB	Gabon	0	19.87		1.98	1	0
GMB	Gambia, The	1	13.55		4.69	0	0
GEO	Georgia	1			0.00	0	0
DEU	Germany	1	6.91		0.00	0	0
GHA	Ghana	1	14.93		2.96	0	0
GRC	Greece	1	6.91		1.24	0	0
GTM	Guatemala	1	10.27		6.03	0	0
GIN	Guinea	1			3.99	0	0
GNB	Guinea-Bissau	1			0.00	0	0
GUY	Guyana	0	13.70		28.23	0	0
HTI	Haiti	0	10.00		81.12	0	0
HND	Honduras	1	8.90		9.21	0	0
HKG	Hong Kong, China	1		2.10	-0.02	0	0
HUN	Hungary	1	12.11		5.40	0	0
ISL	Iceland	1	3.98		1.24	0	0
IND	India	0	48.65	93.80	7.45	0	0
IDN	Indonesia	1	16.27	31.30	7.10	0	0
IRN	Iran, Islamic Rep.	0			1,199.31	0	0
IRQ	Iraq	0			138,935.90	0	0
IRL	Ireland	1	3.98		2.50	0	0
ISR	Israel	1	7.80		2.09	0	0
ITA	Italy	1	6.91		0.00	0	0
JAM	Jamaica	1	14.68		15.46	0	0
JPN	Japan	1	5.98		-0.35	0	0
JOR	Jordan	1	15.83		3.37	0	0
KAZ	Kazakhstan	0			55.34	0	0
KEN	Kenya	1	27.47		15.94	0	0
KOR	Korea, Rep.	1	11.28	25.00	0.03	0	0
KGZ	Kyrgyz Republic	1			n/a	0	0
LVA	Latvia	1	5.73		7.29	0	0
LSO	Lesotho	1	17.40		3.49	0	0
LBR	Liberia	0			2,306.86	0	0
LTU	Lituania	1	4.33		7.45	0	0
LUX	Luxembourg	1	6.91		0.38	0	0
MKD	Macedonia, FYR	1			18.45	0	0

APPENDIX 2-A
Data on Trade Policy

WB Code	Country	OPEN90-99[1] 1 = Open; 0 = Closed	Avg. Tariff (%)[2] 1990-1999 (average)	Core Non-Tariff Barriers (%)[3] 1995-1998 (average)	Black Market Premium (%)[4] 1990-1999 (average)	Export Marketing Board[5]	Socialist[5]
MDG	Madagascar	1	7.13		5.93	0	0
MWI	Malawi	0	19.80		28.83	0	0
MYS	Malaysia	1	11.70	19.60	1.35	0	0
MLI	Mali	1	15.66		1.98	0	0
MLT	Malta	1	7.23		1.20	0	0
MRT	Mauritania	1	28.23		1.55	0	0
MUS	Mauritius	1	27.00	16.70	5.25	0	0
MEX	Mexico	1	12.53	13.40	2.24	0	0
MDA	Moldova	1			0.00	0	0
MAR	Morocco	1	23.75	13.40	3.54	0	0
MOZ	Mozambique	1	16.25		6.87	0	0
MMR	Myanmar	0	5.70		2,280.77	0	0
NPL	Nepal	0	15.28		24.23	0	0
NLD	Netherlands	1	6.91		0.00	0	0
NZL	New Zealand	1	6.35		2.50	0	0
NIC	Nicaragua	1	9.90		9.98	0	0
NER	Niger	1	18.30		1.87	0	0
NGA	Nigeria	0	29.74	11.50	151.32	0	0
NOR	Norway	1	4.87		0.00	0	0
PAK	Pakistan	0	54.73		9.74	0	0
PAN	Panama	1	10.67		0.00	0	0
PNG	Papua New Guinea	0	16.67		16.57	1	0
PRY	Paraguay	1	10.91	0.00	11.83	0	0
PER	Peru	1	16.80		8.75	0	0
PHL	Philippines	1	19.09		4.36	0	0
POL	Poland	1	12.46		2.42	0	0
PRT	Portugal	1	6.91		2.04	0	0
ROM	Romania	0	13.50		104.30	0	0
RUS	Russian Ferderation	0	11.24		50,979.69	1	0
RWA	Rwanda	0	38.40		50.78	0	0
SEN	Senegal	0	13.05		1.98	1	0
SLE	Sierra Leone	0	30.25		61.47	0	0
SGP	Singapore	1	0.32	2.10	0.80	0	0
SVK	Slovak Republic	1	7.35		5.34	0	0
SVN	Slovenia	1	10.60		10.06	0	0
SOM	Somalia	0			246.55	0	0
ZAF	South Africa	1	9.05	8.30	3.46	0	0
ESP	Spain	1	6.91		1.71	0	0
LKA	Sri Lanka	1	24.34	22.70	7.84	0	0
SWZ	Swaziland	1	15.10		7.62	0	0
SWE	Sweden	1	6.91		0.00	0	0
CHE	Switzerland	1	1.38		0.00	0	0
SYR	Syrian Arab Republic	0	16.00		279.97	0	0
TWN	Taiwan, China	1	9.85		0.95	0	0
TJK	Tajikistan	1			n/a	0	0
TZA	Tanzania	0	25.12		22.17	0	0
THA	Thailand	1	29.54	17.50	1.80	0	0
TGO	Togo	0	15.25		1.98	1	0
TTO	Trinidad and Tobago	1	14.86		13.22	0	0
TUN	Tunisia	1	28.25		3.67	0	0
TUR	Turkey	1	15.28	19.80	1.15	0	0
TKM	Turkmenistan	0			42.86	1	0
UGA	Uganda	1	14.37	3.10	19.33	0	0
UKR	Ukraine	0	9.73		9.02	1	0
GBR	United Kingdom	1	6.91		0.00	0	0
USA	United States	1	5.96		0.00	0	0
URY	Uruguay	1	14.00	0.00	9.88	0	0
UZB	Uzbekistan	0			dual x rt.	0	0
VEN	Venezuela	1	14.31	17.70	4.13	0	0
YEM	Yemen, Rep.	1	20.00		8.34	0	0
YUG	Yugoslavia, FR (Serbia/Montenegro)	0			106.44	0	0
ZMB	Zambia	0	18.43	1.00	62.55	0	0
ZWE	Zimbabwe	0	20.43		132.81	0	0

Notes

1 Based on application of Sachs Warner criteria. See Appendices 1 and 3 for further information
2 Unweighted average tariff, 1990-99. Sources: UNCTAD (2001), World Bank (2000), WTO (various trade policy reviews)
3 Core non-tariff barrier frequency on capital good and intermediates; includes quotas, licensing, prohibitions, and administered pricing. Source: Michalopoulos (1999)
4 [[(parallel Xrate/official Xrate) – 1]*100] Source: Easterly and Sewadeh (2000)
5 Based on literature reviews. See Appendix 3 for further informatior

APPENDIX 2-B
Trade Liberalization Dates

WB Code	Country	Periods of Temporary Liberalization (if applicable)	Year Uninterrupted Openness Began (if applicable) [1,2]	
			Sachs and Warner (1995)	Wacziarg and Welch
ALB	Albania		1992	1992
DZA	Algeria		n/a	n/a
AGO	Angola		n/a	n/a
ARG	Argentina		1991	1991
ARM	Armenia		n/a	1995
AUS	Australia		1964	1964
AUT	Austria		1960	1960
AZE	Azerbaijan		n/a	1995
BGD	Bangladesh		n/a	1996
BRB	Barbados		1966	1966
BLR	Belarus		1994	n/a
BEL	Belgium		1959	1959
BEN	Benin		1990	1990
BOL	Bolivia	1956-79	1985	1985
BWA	Botswana		1979	1979
BRA	Brazil		1991	1991
BGR	Bulgaria		1991	1991
BFA	Burkina Faso		n/a	1998
BDI	Burundi		n/a	1999
CMR	Cameroon		1993	1993
CAN	Canada		1952	1952
CPV	Cape Verde		n/a	1991
CAF	Central African Republic		n/a	n/a
TCD	Chad		n/a	n/a
CHL	Chile		1976	1976
CHN	China		n/a	n/a
COL	Colombia		1986	1986
ZAR	Congo, Dem. Rep.		n/a	n/a
COG	Congo, Rep.		n/a	n/a
CRI	Costa Rica	1952-61	1986	1986
CIV	Cote d'Ivoire		n/a	1994
HRV	Croatia		1993	n/a
CYP	Cyprus		1960	1960
CZE	Czech Republic		1991	1991
DNK	Denmark		1959	1959
DOM	Dominican Republic		n/a	1992
ECU	Ecuador	1950-82	1991	1991
EGY	Egypt, Arab Rep.		n/a	1995
SLV	El Salvador	1950-61	1989	1989
EST	Estonia		1992	n/a
ETH	Ethiopia		n/a	1996
FIN	Finland		1960	1960
FRA	France		1959	1959
GAB	Gabon		n/a	n/a
GMB	Gambia, The		1985	1985
GEO	Georgia		n/a	1996
DEU	Germany		1959	1959
GHA	Ghana		1985	1985
GRC	Greece		1959	1959
GTM	Guatemala	1950-61	1988	1988
GIN	Guinea		1986	1986
GNB	Guinea-Bissau		1987	1987
GUY	Guyana		1988	1988
HTI	Haiti		n/a	n/a
HND	Honduras	1950-61	1991	1991
HKG	Hong Kong, China		Always	Always
HUN	Hungary		1990	1990
ISL	Iceland		n/a	n/a
IND	India		1994	n/a
IDN	Indonesia		1970	1970
IRN	Iran, Islamic Rep.		n/a	n/a
IRQ	Iraq		n/a	n/a
IRL	Ireland		1966	1966
ISR	Israel		1985	1985
ITA	Italy		1959	1959
JAM	Jamaica	1962-1973	1989	1989
JPN	Japan		1964	1964
JOR	Jordan		1965	1965
KAZ	Kazakhstan		n/a	n/a
KEN	Kenya	1963-67	1993	1993
KOR	Korea, Rep.		1968	1968
KGZ	Kyrgyz Republic		1994	1994
LVA	Latvia		1993	1993

APPENDIX 2-B
Trade Liberalization Dates

WB Code	Country	Periods of Temporary Liberalization (if applicable)	Year Uninterrupted Openness Began (if applicable) [1,2]	
			Sachs and Warner (1995)	Wacziarg and Welch
LSO	Lesotho		n/a	n/a
LBR	Liberia		n/a	n/a
LTU	Lituania		1993	1993
LUX	Luxembourg		1959	1959
MKD	Macedonia, FYR		1994	1994
MDG	Madagascar		n/a	1996
MWI	Malawi		n/a	n/a
MYS	Malaysia		1963	1963
MLI	Mali		1988	1988
MLT	Malta		n/a	n/a
MRT	Mauritania		1992	1995
MUS	Mauritius		1968	1968
MEX	Mexico		1986	1986
MDA	Moldova		1994	1994
MAR	Morocco	1956-64	1984	1984
MOZ	Mozambique		n/a	1995
MMR	Myanmar		n/a	n/a
NPL	Nepal		1991	1991
NLD	Netherlands		1959	1959
NZL	New Zealand		1986	1986
NIC	Nicaragua	1950-60	1991	1991
NER	Niger		n/a	1994
NGA	Nigeria		n/a	n/a
NOR	Norway		Always	Always
PAK	Pakistan		n/a	2001
PAN	Panama		n/a	1996
PNG	Papua New Guinea		n/a	n/a
PRY	Paraguay		1989	1989
PER	Peru	1948-67	1991	1991
PHL	Philippines		1988	1988
POL	Poland		1990	1990
PRT	Portugal		Always	Always
ROM	Romania		1992	1992
RUS	Russian Ferderation		n/a	n/a
RWA	Rwanda		n/a	n/a
SEN	Senegal		n/a	n/a
SLE	Sierra Leone		n/a	2001
SGP	Singapore		1965	1965
SVK	Slovak Republic		1991	1991
SVN	Slovenia		1991	1991
SOM	Somalia		n/a	n/a
ZAF	South Africa		1991	1991
ESP	Spain		1959	1959
LKA	Sri Lanka	1950-56; 77-83	1991	1991
SWZ	Swaziland		n/a	n/a
SWE	Sweden		1960	1960
CHE	Switzerland		Always	Always
SYR	Syrian Arab Republic	1950-65	n/a	n/a
TWN	Taiwan, China		1963	1963
TJK	Tajikistan		n/a	1996
TZA	Tanzania		n/a	1995
THA	Thailand		Always	Always
TGO	Togo		n/a	n/a
TTO	Trinidad and Tobago		n/a	1992
TUN	Tunisia		1989	1989
TUR	Turkey	1950-53	1989	1989
TKM	Turkmenistan		n/a	n/a
UGA	Uganda		1988	1988
UKR	Ukraine		n/a	n/a
GBR	United Kingdom		Always	Always
USA	United States		Always	Always
URY	Uruguay		1990	1990
UZB	Uzbekistan		n/a	n/a
VEN	Venezuela	1950-59; 89-93	n/a	1996
YEM	Yemen, Rep.		Always	Always
YUG	Yugoslavia, FR (Serbia/Montenegro)		n/a	2001
ZMB	Zambia		1993	1993
ZWE	Zimbabwe		n/a	n/a

Notes

1 Based on latest date of uninterrupted openness

2 Based on the Sachs Warner criteria along with broader literature review. See Appe

APPENDIX 3 – A

Country Summaries of Trade Policy Changes During the 1990s

Albania	Open since 1992 (Sachs and Warner, 1995; EBRD, 1994). Albania's black market premium averaged 8% between 1996 and 1999 (Easterly and Sewadeh, 2002). We have limited tariff and lack NTB data. However, the average unweighted tariff in 1997 was 15.9%. Its state trading monopoly was removed in 1992 (EBRD, 1997).
Algeria	Closed based on black market exchange rate premium. Economic liberalization that began in the mid-1980s has included trade promotion and devaluation of the dinar. However, reforms have slowed since a financial crisis in 1992 (EIU).
Angola	Closed based on black market exchange rate premium. Angola was declared a socialist country in 1977 when the Movement for the Liberation of Angola gained power. The country is engulfed in civil conflict that erupted in 1975 and has continued despite attempts to implement peace agreements in 1991 and 1994. The structures of a socialist economic system remain, including numerous parastatals, an overvalued foreign exchange rate, price controls, and rationed import licenses (Paulson, 1999).
Armenia	Open since 1995. According to EBRD (1997), Armenia has one of the most liberal trade regimes among the CIS countries. Armenia has both liberal trade and foreign exchange regimes. Import duties are limited to a uniform 10% rate and NTBs are levied strictly for technical, health and safety reasons (IMF, 2001a). The country has no black market premium. Currency export surrender requirements were eliminated in 1995 (EBRD, 1997).
Azerbaijan	Open since 1995. Since gaining independence from the Soviet Union in 1991, Azerbaijan has implemented market and trade liberalization policies. In 1995, a unified exchange rate was instituted and the differentiated surrender prices at sub-market prices were abolished. Import tariffs range from 0-15% and NTBs have been nearly entirely abolished. State-owned trading companies involved in importing and exporting goods, including the cotton monopoly, have been either privatized or liquidated, the majority by 1994 (IMF, 1998a; EBRD, 1997).
Bangladesh	Open since 1996. However, based on the OPEN90-99 dummy, Bangladesh is considered closed because it exceeded the decade-long tariff and black market premium criteria. Its average tariff rate between 1990 and 1999 was 44% and it black market premium averaged 83% (Easterly and Sewadeh, 2002). In 1996, Bangladesh's black market exchange rate premium fell below 20%. As of 2000, Bangladesh still had relatively high levels of tariff and non-tariff trade barriers, however they did not exceed the Sachs and Warner criteria. Bangladesh's average tariff rate was 20.7% and non-tariff barrier coverage was 9.8% (UNCTAD, 2001).
Belarus	Closed. Belarus has not made substantial gains in trade liberalization (EBRD, 1997). The Belarusian economy is highly dollarized and maintains a multiple exchange rate system. In the beginning of 2000, the black market exchange rate premium was 300% (IMF, 2000). Agriculture remains highly centralized and the state is responsible for establishing price, margin, and trade controls and procuring crop and livestock products (IMF, 2000a). We conclude that such monopoly powers constitute an export monopoly similar to an export marketing board.

	Note that Sachs and Warner (1995) cite that Belarus opened in 1994. However, the Sachs and Warner paper classifies the Post-Communist countries strictly on the basis of EBRD (1994) standards of openness that do not include the black market premium. We lack black market premium data for Belarus except for the data from the IMF noted above. However, based on the multiple exchange rate system and the export marketing monopoly, we classify Belarus as never open.
Bulgaria	Open since 1991 (Sachs and Warner, 1995; EBRD, 1994). Its black market premium has averaged only 6% between 1990-1999. Its unweighted average tariff was 16.6% and 17.6% in 1997 and 1998, respectively (World Bank, 2000). The tariff rate was reduced to 13.8% and 12.4% in 2000 and 2001, respectively (IMF, 2001). While quantitative restrictions and other NTBs remained through 1997, they had been eliminated by 2000 (IMF, 2001b). However, such barriers had already been reduced to minimal levels by 1991 (EBRD, 1997).
Burkina Faso	Open since 1998. Cotton, Burkina Faso's primary export industry, has been gradually liberalized since 1998. The state sold 30% of its cotton monopoly SOFITEX to producers' associations and retains minority (36%) control (IMF, 2002a). It maintains an export monopoly on the distribution, but not export, of petroleum products and therefore satisfies the Sachs Warner (1995) marketing board criteria. In 1998, Burkina Faso and the other nations included in the West African Economic and Monetary Union (WAEMU) introduced a common external tariff and reduced internal tariffs. Maximum overall tariffs were reduced from 37% to 29%. By 2000, the CET was 5-20%, depending on specific products, and internal tariffs had been eliminated (IMF, 2000b).
Burundi	Open since 1999. In 1999, Burundi's black market exchange rate premium fell below 20% (Easterly and Sewadeh, 2002). The marketing monopoly of the Burundi Coffee Company (BCC) was abolished in 1993 and replaced by an auction system in which private exporters participate (IMF, 1997). The literature does not refer to tariff or other non-tariff barriers such as quotas or explicit bans.
Cape Verde	Open since 1991. There is limited data on Cape Verde. It implemented an economic and trade liberalization program in 1991. Its average unweighted tariff was 24.1% in 1996 and 20% in 1997, the only two years for which tariff data is available (World Bank, 2000). The state monopolies on importing sugar, oils, corn, and rice were abolished through trade reforms in 1999. Quantitative export restrictions were also replaced with customs duties in 1999 (IMF, 1999a). However, based strictly on the Sachs Warner criteria, it appears that Cape Verde should be classified as open during the early 1990s when the liberalization program initially reduced tariffs and NTBs.
Central African Republic	Remains closed. Based on the IMF (2001c), the Central African Republic is in the process of liberalization. According to this Letter of Intent, the cotton agency remains a public monopoly and the sugar trade regime is to be liberalized in 2002 (IMF 2001c). Therefore, there is not yet sufficient evidence to classify C.A.R. as an open economy.
Chad	Remains closed. Based on the IMF Letter of Intent (1999b), while some progress was made toward liberalizing the economy over the 1995-1999 period, the structural reform program, including privatization of the state's sugar and cotton monopolies, has yet to be implemented. Like Sachs and Warner (1995), we were unable to obtain tariff or non-tariff barrier data.

China	Remains closed based on the undivided power of the Communist Party and its black market exchange rate premium, which averaged 36% between 1990-1999 (Easterly and Sewadeh, 2002). In addition, China had a relatively high average tariff rate, 31%, between 1990-1999, however this does not exceed the Sachs Warner criterion.
Congo (Dem. Rep)	Remains closed based on black market exchange rate premium and export marketing board. In 1993, the government abolished marketing monopolies for cocoa and coffee, timber, and other products (Paulson, 1999). However, GECAMINES, the public enterprise responsible for copper and cobalt production retains an export monopoly. In 2000, the state instituted monopoly control over diamond exports (IMF, 2001d).
Congo (Republic of)	Remains closed. A former Socialist country, Congo completed a transition to a multi-party democracy in 1992. Armed conflict throughout the late 1990s has limited economic reform. While economic liberalization is planned for 1999-2002, there is insufficient progress to date (IMF, 2000d).
Cote d'Ivoire	Open since 1994. In 1994, the state export promotion agency CCIA was replaced by a new private export promotion agency, APEXCI. In addition, CIASTAB, or external cocoa and coffee marketing board, was also reformed to allow more private sector participation (Devarajan et al, 2001). SW classified Côte d'Ivoire as closed as of the end of 1994, but we found that it liberalized in 1994 based on the reform of state marketing boards.
Croatia	Closed based on black market premium, which averaged 38% between 1990 and 1999 (Easterly and Sewadeh, 2002). Croatia has a relatively liberal trade regime based on the other openness indicators and the EBRD (1997). All import quotas were abolished between 1994 and 1996. Croatia's simple average tariff is 12.1% and its weighted average is 9% (IMF, 2000e). Our classification of Croatia as closed differs from the Sachs and Warner (1995) paper which cited Croatia as open since 1993. However, the Sachs and Warner paper classifies the Post-Communist countries strictly based on the EBRD (1994) standards of openness which do not include the black market premium. We lack black market premium data for Croatia prior to 1996 and therefore cannot ascertain whether a temporary period of liberalization existed or if Croatia was never open based on the complete Sachs and Warner criteria.
Czech Republic	Open since 1991 (Sachs and Warner, 1995; EBRD, 1994). According to the WTO, trade liberalization has been an import part of the country's overall economic reform during the latter 1990s (WTO, 2001c). The country is well-integrated into the open economy: its merchandise (exports and imports) to GDP ration was 120% in 2000. Its average MFN tariff rate was 6% in 2001 and the country has relatively few NTBs. However, the Czech Republic continues to impose higher tariffs on agricultural goods: the MFN tariff rate for agricultural products was 13.4% in 2001 (WTO, 2001c). Its overall average unweighted tariff averaged 6.1% for the period 1986 through 1999 (World Bank, 2000).
Dominican Republic	Open since 1992. Trade liberalization began in the early 1990s and the black market exchange rate premium fell below 20% in 1992. While we lack tariff data prior to 1994, the Dominican Republic had reduced its average tariff rate to 17.8% in 1994. As part of its agreement to join the WTO in 1995, the Dominican Republic agreed to further reduce average tariffs, introduce a maximum tariff rate of 40% and eliminate all nontariff barriers (IMF, 1999c).

	SW classified the Dominican Republic as closed as of 1994. However, the black market premium fell below the 20% threshold and the country continuously satisfied all criteria for the first time in 1992.
Egypt	Open since 1995. Egypt launched an economic stabilization and trade liberalization program in 1990/91. According to the WTO (1999a), a great deal of progress was made in gradually reducing tariff and non-tariff barriers between 1991 and 1999. We date Egypt's openness to 1995, a rough midpoint of this liberalization period. However, admittedly, this is a somewhat arbitrary date in the absence of a discrete policy change that resulted in Egypt satisfying the Sachs Warner criteria. Egypt's black market premium decreased from 70% to 10% between 1990-1991 (Easterly and Sewadeh, 2002). However, it maintained high tariff and non-tariff barriers. Its core NTBs averaged 57.3% between 1989 and 1994 (Michalopoulus, 1999). Unweighted tariff rates averaged 42.2% in 1991 before falling to 28.3% in 1994 (World Bank, 2000). Egypt continues to maintain a relatively restrictive trade regime. Its average tariff rate during the period 1995-1999 was 26.1%; its non-tariff measures covered 28.8% of trade (UNCTAD, 2001).
Estonia	Closed based on black market premium, which averaged 25% between 1996 and 1999 (Easterly and Sewadeh, 2002). Based on UNCTAD (2001) data, its tariff rate averaged 1% between 1995 and 1999 and it did not employ NTBs during the period (UNCTAD, 2001; EBRD, 1997). Our classification of Estonia as closed differs from the Sachs and Warner (1995) paper which cited it as open since 1992. However, the Sachs and Warner paper classifies the Post-Communist countries strictly based on the EBRD (1994) standards of openness which do not include the black market premium.
Ethiopia	Open since 1996. Economic liberalization began in 1990; in 1991 the socialist Derg regime lost power. In 1994, the Federal Democratic Republic of Ethiopia was created and in 1995 elections held. In 1996, the government entered into an IMF Enhanced Structural Adjustment Facility which included measures to liberalize the country's trade regime. The majority of export taxes were eliminated; the parastatal monopoly in coffee marketing was effectively abolished; and maximum import duties were lowered to 40%. The currency, the birr, was allowed to float, thereby resulting in the convergence of the official, auction, and parallel market exchange rates (Devarajan et al, 2001).
Gabon	Remains Closed. Based on the WTO (2001d) and IMF (2000f), it appears that trade liberalization is not proceeding very rapidly and that sufficient progress has yet to be made. The state retains monopoly power in several export industries, most notably the petroleum industry. Its tariff barriers averaged 20% during the 1990s (World Bank, 2000).
Georgia	Open since 1996, when quantitative restrictions on exports were substantially removed (EBRD, 1997). Georgia's simple average tariff rate was 10.9% in 2001 (IMF, 2001e). Georgia did not have a black market premium, based on (Easterly and Sewadeh, 2002).
Haiti	Remains closed based on the Sachs Warner black market exchange rate criterion. Its BMP averaged 81% between 1990 and 1999 (Easterly and Sewadeh, 2002). Based on the other openness criteria, however, Haiti has a highly liberal trade regime. According to the IMF (2001f), Haiti has one of the

	most liberal trade regimes. In the Western Hemisphere, only Chile and Panama have similarly liberal trade regimes, based on the IMF's 1999 index of tariff and non-tariff barriers.
Iceland	Open. Insufficient historical data to assign date of opening. Iceland is highly dependent on foreign trade; its merchandise trade to GDP ratio was over 50% in 1999 (WTO, 2000a). According to the WTO, its average MFN tariff rate was 4% in 1999 and non-tariff barriers were limited.
India	SW classified India as open since 1994. However, India did not satisfy the tariff openness criteria until 1996 when its average tariff rate fell from 41.0% to 38.6% (World Bank, http://www1.worldbank.org/wbiep/trade/TR_data.html) Based on India's core NTBs, which averaged a frequency of 93.8% between 1995-1998, we classify India as closed over the entire 1990s decade (see Michalopoulos (1999)). India's nontariff barriers have been recently reduced below the 40% coverage rate, although these measures seem to have been replaced with a flurry of phytosanitary measures and antidumping duties. We lack comparable data to pass definitive judgment on the level of Indian NTBs after 1998. See Wacziarg (2003) for data suggesting that India is still roughly twice as closed as China, on a variety of measures of trade openness. While significant trade liberalization occurred in 1994 (Sachs and Warner 1995, TIDE, 1994), this liberalization involved primarily reducing tariff and foreign exchange trade barriers (TIDE, 1994). Liberalization since 1997 has focused more on decreasing NTBs. Due to a WTO-ruling, India was required to remove all QRs by April, 2001. However, according to the IMF (2001g), "a number of (other) NTBs have been retained and in some cases enhanced." We lack specific data regarding the current level of NTBs.
Iran	Remains closed based on its black market exchange rate premium, which averaged 1,199 % between 1990 and 1999 (Easterly and Sewadeh, 2002).
Iraq	Remains closed based on black market exchange rate premium, which averaged 138,936% between 1990 and 1999 (Easterly and Sewadeh, 2002).
Kazakhstan	Closed based on black market premium. However, Kazakhstan has a liberal trade regime, based on other indicators. During 1995, all export quotas and most licensing requirements were abolished. Import tariffs were reduced substantially in 1995 and by 1997 had fallen to 12% (weighted average). Monopoly rights of state trading organizations were abolished in 1994 (EBRD, 1997).
Kyrgyz Republic	Open since 1994 (Sachs and Warner, 1995; EBRD, 1994). According to the IMF (2000g), the Kyrgyz Republic engaged in rapid liberalization following its independence from the Soviet Union in 1991 and is currently one of the most open countries in among the Baltics, Russia, and other CIS countries. Between 1994 and 1998, the Kyrgyz Republic had a uniform 10% tariff on all imports. It implemented a multi-level tariff structure in 1999 and the average tariff was reduced to 9.18% in 1999 and 5.21% in 2000 (IMF, 2000g). NTMs are limited and are employed only for security and safety measures.
Latvia	Open since 1993 (Sachs and Warner, 1995; European Bank for Reconstruction and Development, 1994). Its black market premium averaged 0.07% between 1996 and 1999 and its average tariff over the 1995-1999 period was 4.2%. It lacked NTBs in 1999 (UNCTAD, 2001).

Lesotho	Not rated. Insufficient data on trade policy.
Liberia	Closed based on black market exchange rate premium.
Lithuania	Open since 1993 (Sachs and Warner, 1995; European Bank for Reconstruction and Development, 1994). Lithuania's average tariff over the 1995-1999 period was 3.5% and it lacked NTBs in 1999 (UNCTAD, 2001). Its black market premium averaged 7% between 1996 and 1999 (Easterly and Sewadeh, 2002).
Macedonia (FYR)	Open since 1994 (Sachs and Warner, 1995; European Bank for Reconstruction and Development, 1994). In 1996, it implemented further trade liberalization, decreasing its average unweighted tariff from 28% to 15% and eliminating NTBs with the exception of security and health restrictions (IMF, 1998b). In addition, in 1996, the state agricultural enterprises and cooperatives along with an extensive system of price controls were liberalized (IMF, 2000g).
Madagascar	Open since 1996. Agricultural exports were gradually liberalized over the period 1985 to 1992 (Paulson, 1999). Under the privatization and liberalization program launched in 1996, most agricultural marketing boards have been liquidated and state monopolies have been virtually abolished (WTO, 2001f). Therefore, we conclude that this is sufficient progress to classify Madagascar as an open state without export monopoly trade barriers.
Malawi	Remains closed based on its black market exchange rate premium. Tariffs are Malawi's primary trade policy instruments; its average tariff rate was 14% in 2000/01. State controls on marketing have been removed (WTO, 2002b).
Malta	Open. Insufficient historical data to assign date of opening. Malta is dependent on foreign trade with Europe and is in the process of harmonizing its trade policies with those required by the EU. Malta's implicit import tariff rate (calculated as the ratio of total import duties to the total c.i.f. value of imports) is 1%, down from an average of 9% in 1990-94 (IMF, 1999d).
Mauritania	Open. We cite 1997 as the opening date. According to Sachs and Warner (1995, p. 86), Mauritania has been open since 1992, although it was included in the list of countries that remained closed in 1994 (p. 24). We disagree with the 1992 opening date based on IMF evidence of continued exchange rate and export monopoly trade barriers (IMF, 1999e). Between 1992 and 1995, Mauritania had a two-tiered exchange rate in order to limit the foreign exchange available for import purposes. During this time, a parallel cash market existed which exceeded the official rate by "as much as 20%" (IMF, 1999e). In 1995, a unitary exchange system was restored. We lack Easterly and Sewadeh (2002) data regarding the black market premium from 1990-1996. Since 1997, nearly all export monopolies have been eliminated[1]. Finally, according to the IMF, the government significantly reduced its tariff regime in 1997, although previous rates did not exceed the 40% criteria in Sachs Warner.
Moldova	Open since 1994 (Sachs and Warner, 1995; European Bank for Reconstruction and Development, 1994). Moldova pursued aggressive trade liberalization during the mid-1990s. Between 1996 and 1999, its weighted average tariff was 4.3% and simple average tariff was 9.6% (IMF, 2001h). However, agricultural

[1] The fish exporting agency (SMCP), in which the state now only owns a 35% stake, is the exception.

	reform has been a slower process. As of 2001, 95% of state-owned and collective farms have been privatized; half of the farms were privatized in the period April 2000 through January 2001 (IMF, 2001h)
Mozambique	Open since 1995. Mozambique is no longer a Socialist state based on the Kornai (1992) definition. It adopted a new constitution in 1990 that allowed for a multi-party system. During the late 1980s through early 1990s, government-established producer prices were gradually increased and then liberalized and the role of state trading companies was reduced (Paulson, 1999). Since 1995, the agricultural sector has been increasingly liberalized. The state no longer has a monopoly on exports, despite its continued involvement in the cashew and sugar industries (WTO, 2001i). Mozambique's simple average applied MFN tariff is 13.8% (WTO, 2001i). Its unweighted tariff has ranged between 15% and 16% from 1987 until the present, in all years for which data is available (World Bank, 2000). Based on Sachs and Warner (1995) and available tariff and black market premium data, we conclude that agricultural protection was the primary factor in the Sachs Warner classification. Therefore, we identify 1995 as the first year of openness.
Myanmar	Remains closed based on its black market exchange rate premium.
Niger	Open since 1994. Through the 1994 reform program, the currency was devalued and public export monopolies were abolished (World Bank, 2000b). Its BMP averaged only 2% between 1990-1999 and its tariff rate averaged 18% during the same period (Easterly and Sewadeh, 2002; World Bank, 2000). SW classified Niger as closed as of the end of 1994, but we found that it liberalized in 1994 based on the reform of state marketing boards.
Nigeria	Remains closed based on its black market exchange rate premium. However, Nigeria has made substantial progress in liberalizing its trade regime and has abolished export marketing boards (WTO, 1998b).
Pakistan	Open since 2001. However Pakistan was closed based on the OPEN90-99 criteria for the decade due to its tariff barriers, which averaged 55% between 1990-1999 (World Bank, 2000). In 1999, Pakistan launched the Economic Revival Program. Pakistan has liberalized its export regime and significantly reduced its monopoly on exports (WTO, 2002c). In 2001, Pakistan undertook a major restructuring of its customs tariff, thereby decreasing its average tariff to 20.4% from 56% in 1993/94 (WTO, 2002c).
Panama	Open since 1996. According to the IMF (1999f), in the late 1980s, Panama had one of the most complex and distortionary trade regimes in the region. However, trade reform initiated in 1990 has transformed the economy into one of the most open economies. Tariff reductions began in 1991, however non-tariff barriers remained extensive until 1996 when, under an agreement to join the WTO, NTBs were significantly reduced. Tariffs averaged 7.6% for the period 1995-2000 (UNCTAD, 2001).
Papua New Guinea	Remains closed based on its COPRA export marketing board which has a monopoly both on domestic and export markets (WTO, 1999b). Papua New Guinea was closed in Sachs and Warner (1995) based on its black market premium. Its average premium for the period 1995-1999 was 18%, however in 1998, the premium was 67% (Easterly and Sewadeh, 2002). We only have

	limited tariff and non-tariff barrier data. In 1997, the average tariff rate was 18.5%; non-tariff barriers covered 0.1% of trade (UNCTAD, 2001).
Romania	Open since 1992 (Sachs and Warner, 1995; European Bank for Reconstruction and Development, 1994). By 1992, Romania had eliminated the state's monopoly on trade (WTO, 1999c). However, economic liberalization in Romania has not been as extensive as in other Eastern European countries and state-enterprises continue to play a major role in the economy (WTO, 1999c). Its average unweighted tariff has ranged from 6% to 19.8% between 1995 and 1999 (World Bank, 2000). The country's black market premium fell below 20% for the first time in 1997, although the decade-long average does not exceed 20%.
Russia	Closed based on black market premium, which averaged 50,980% between 1990 and 1999 (Easterly and Sewadeh, 2002). Russia has gradually transitioned toward a more market-based economic system, despite the economic crisis in 1998. Russia's unweighted tariff rate averaged 11.24% between 1990 and 1999 (World Bank, 2000). The state has also exerted monopoly power through state-owned enterprises, such as Gazprom in the energy sector.
Rwanda	Remains closed based on its black market exchange rate premium.
Senegal	Remains closed. Senegal continues to maintain an export monopoly in the cotton industry (World Bank, 1999).
Sierra Leone	Open since 2001. Due to the civil war in Sierra Leone, economic and trade liberalization was severely limited during the 1990s. However, in recent years, economic liberalization has progressed. The spread between the official and parallel market exchange rates decreased from 35% in February 2000 to 5% in December 2000. In 2001, the maximum tariff was reduced from 40% to 30%. Finally, the state export marketing board was abolished (IMF, 2001i).
Slovak Republic	Open since 1991 (Sachs and Warner, 1995; European Bank for Reconstruction and Development, 1994). The Slovak Republic relied on a relatively free trade regime in its transition toward a market-based economy. The simple average MFN tariff was 6.1% in 2001, down from 8% in 1995 (WTO, 2001j). Based on World Bank data, the 1990-1999 average unweighted tariff was 7.35% (World Bank, 2000). However, the country maintains protection for the agricultural sector.
Slovenia	Open since 1991 (Sachs and Warner, 1995; European Bank for Reconstruction and Development, 1994). Slovenia has a relatively free trade regime. Although tariff and NTB data is limited, Slovenia's average unweighted tariff was 10.6% in 1996 and 2000 (World Bank, 2000). Based on IMF data (1998c), 98% of imports were free of quantitative restrictions, the primary NTB, by 1996.
Somalia	Closed on the basis of its black market premium, which averaged 247% between 1990-1999 (Easterly and Sewadeh, 2002). While Somalia was classified as a Socialist state in 1987 by Kornai (1992), it has been a country effectively without a national government since 1991 (Paulson, 1999).
Swaziland	Open. Insufficient historical data to assign date of opening. Swaziland's average unweighted tariff weight was 15.1% in 1997 (World Bank, 2000). Its NTBs and black market premium satisfy the Sachs and Warner (1995) criteria for openness. While Swaziland's black market premium has remained less than

	20% since 1986, we lack sufficient data for the other variables to assign an opening date.
Syrian Arab Republic	Remains closed based on its black market exchange rate premium.
Tajikistan	Open since 1996. According the IMF, exchange rate and trade liberalization were virtually completed by 1996 (IMF, 1998d). By 2000, Tajikistan's average tariff rate was less than 10% and it had no major NTBs (IMF, 2000h). In addition, in 1996, the former state cotton enterprise, Glavkhlopkoprom's monopoly on cotton exports was abolished (IMF, 1998d). We lack data on its black market premium.
Tanzania	Open since 1995. Tanzania had been a highly socialist state (despite the fact that it was not labeled as such in Kornai (1992) and therefore in the original Sachs and Warner, 1995.) Tanzania began a democratic transition in the early 1990s and opposition parties were officially registered in 1992 (Devarajan et al, 2001). The first multiparty election occurred in 1995. Since 1995, trade liberalization has accelerated and the government has withdrawn from any direct agricultural marketing activities (WTO, 2001k).
Trinidad and Tobago	Open since 1992. Sachs and Warner (1995) classified Trinidad and Tobago as closed as of 1994 based on their black market premium indicator and discussion in *Trends in Developing Economies*, 1994 (TIDE). However, Trinidad and Tobago initiated an economic and trade liberalization program in the mid-1980s that has led to the elimination of major trade barriers (WTO, 1998e). Its average unweighted tariff decreased from 17.3% in 1988 to 9.2% in 1998 (World Bank, 2000). We cite 1992 as the date of opening due to the fact that the black market premium decreased from 33% in 1991 to 17% in 1992, thereby satisfying the Sachs and Warner criteria (Easterly and Sewadeh, 2002). SW classified the Dominican Republic as closed as of 1994. The country continuously satisfied all criteria for the first time in 1992.
Turkmenistan	Turkmenistan remains closed based on its black market premium which was 43% in 1999 after the country's dual exchange rate system was replaced by a unitary system in 1998 (Easterly and Sewadeh, 2002; IMF, 1999g). The state continues to have an export monopoly over cotton, the country's primary export crop. Turkmenpahta is essentially an agricultural marketing board (IMF, 1999g). We lack data on tariff and non-tariff barriers for Turkmenistan.
Togo	Remains closed. Togo still maintains an export monopoly over cotton, its primary cash crop. However, under the 1994-1997 Structural Adjustment Program, Togo liberalized portions of its agriculture industry and abolished its coffee and cocoa marketing boards (WTO, 1999d). Its average tariff rate was 15% between 1990-1999 (World Bank, 2000).
Ukraine	Remains closed. Ukraine's tariff barriers are relatively low, averaging 9.7% (unweighted) between 1990 and 1999 (World Bank, 2000). However, its NTBs complicate the trade regime and limit overall liberalization. Ukraine continues to maintain numerous state monopolies in the agriculture sector, which include export monopolies. The National Bank of Ukraine imposed exchange restrictions in August 1998 (IMF, 1999h).
Uzbekistan	Remains closed. Uzbekistan has a dual exchange rate system and the spread between the official and parallel market rates was 40% in 1999 (IMF, 2000i). Uzbekistan's average tariff rate increased from 14% in 1995 to 26% in 1999 (IMF, 2000i).

Venezuela	Open since 1996. In 1989, Venezuela's import substitution policies were replaced by a more open trade regime, the country implemented a flexible exchange rate and reduced trade barriers prior to becoming a member of GATT in 1990 (WTO, 1996). However, foreign exchange restrictions were imposed in 1993, leading Sachs and Warner (1995) to classify the country as closed. While such exchange restrictions constituted trade barriers, Venezuela did not slip in terms of other trade liberalization efforts. Therefore, we cite 1996, the year in which the exchange controls were abolished, according to the IMF (1998d), as the year of opening.
Yugoslavia, (FR)	We conclude that FR Yugoslavia (referring to Montenegro and Serbia) opened in 2001. However, it was closed on the basis of the OPEN90-99 black market premium criterion, as its BMP averaged 106% between 1990-1999[2]. Sachs and Warner classified the Federal Republic (FR) of Yugoslavia as closed in 1994 because it had been a Socialist state. Despite liberalization episodes between 1965-74 and 1983-85, Yugoslavia remained Socialist until the Communist party's undivided rule collapsed in 1990. The 1990s were marked by ethnic conflict and trade sanctions imposed by the United Nations. FR Yugoslavia carried out significant liberalization in 2001, including nearly eliminating quantitative restrictions and licensing requirements (World Bank, 2001).
Zimbabwe	Zimbabwe remains closed based on the black market exchange rate premium. In addition, the unweighted tariff, including surcharges, has been only slightly reduced from 39% to 36% through a new tariff structure that came into effect in September 2000. There are also a number of NTBs (IMF, 2002b).

[2] Note, however, that this decade average is only based on 1990 data. No subsequent BMP data is available.

APPENDIX 3 – B

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APPENDIX 4 - Trade Liberalization and Concurrent Events in a Sample of 13 Countries

Country	Year of liberalization	Sample period	Policy Changes and Political Events
Countries with Negative or Zero Post-Liberalization Growth Changes			
Hungary	1990	1971-1998	Hungary experienced a period of declining growth and generally poor economic conditions between 1971, the beginning of our data, and 1991, after liberalization occurred. 1988 and 1989 were years of political change: the majority party leader changed after 30 years and a period of political uncertainty ensued (EIU). The new government implemented a stabilization program in 1989, which included higher taxes, tighter monetary policy, and the devaluation of the currency (World Bank, 1995) In 1990/1991, an IMF restructuring program was implemented. Structural reforms, including currency devaluation, a new exchange-rate mechanism, a tight wage policy in the public sector, and fiscal measures to enhance revenues and cut expenditures, were implemented in 1995. Hungary accelerated privatization efforts, restructuring enterprises (including major commercial banks) and implementing financial sector and public finance reforms, in the mid-1990s. There have also been significant improvements in the legal and regulatory framework of the financial sector (Wacziarg and Wallack, 2003). 1992/1993 marked the beginning of an economic recovery. During the mid 1990s, Hungary adhered to the IMF plan and experienced gradual stabilization and recovery. However, Hungary's growth did not return to the levels seen prior to liberalization. Persisting high levels of debt and current account deficits may have limited Hungary's gains from trade liberalization. In addition, in 1993, the government tightened monetary policy and increased the interest rate, which likely dampened the economic recovery (World Bank, 1995). Finally, while structural reforms were implemented in 1995, the full effects may not have been evident before the end of our data in 1998.
Mexico	1986	1951-1998	Prior to liberalization, the 1940s-1960s was a period of political and social stability and relatively high economic growth (Tornell). However, in the early 1970s, expansionary fiscal and monetary policy led to increasing levels of debt, escalating prices, and an overvaluation of the exchange rate. By 1976, inflation was increasing and private investment decreasing. In August 1976, the government was forced to devalue the peso and decrease government expenditure (Gonzalez, 1994). Oil, discovered in 1977, stimulated the economy between 1978 and 1982 and in 1981 accounted for ¾ of Mexico's exports. However, financed by international borrowing, government spending increased and again resulted in the overvaluation of the peso. By mid-1981, the international price of oil had fallen and by 1982, Mexico declared itself unable to service its debt. The government devalued the peso by 30% in February 1982 and implemented a two-tiered foreign exchange system in August, 1982. Mexico experienced a severe recession during the Latin American debt crisis between 1982-83 (Gonzalez, 1994). In 1984, Mexico pursued a policy of privatization and liberalization in order to attract FDI (Henry, 1999). In 1985, it implemented a program of stabilization and structural adjustment, including trade liberalization. It joined GATT in 1986 and significantly reduced import restrictions and tariff barriers. A debt rescheduling agreement was signed in August 1985. In July 1986, an IMF agreement was implemented, facilitating additional debt restructuring. Further

Country	Year of liberalization	Sample period	Policy Changes and Political Events
			trade liberalization measures were implemented in August, 1987. (Henry, 1999). Mexico also pursued a privatization program during the 1980s, which continued into the 1990s, with the privatization of the banking industry (Wacziarg and Wallack, 2003, and Henry, 1999). An economic and fiscal crisis occurred again in 1994-1995. This was accompanied by a period of political unrest, including the Chiapas uprising and the assassination of several PRI figures (Henry, 1999). In December 1994, Mexico devalued the peso and implemented a floating exchange rate regime. In 1995, the country received a bailout, which prevented it from defaulting on its debt and allowed further access to international capital markets (Tornell, 2002). Despite the economic recovery and trade liberalization that occurred during the late 1980s, Mexico never recovered to its pre-crisis levels of growth. The persisting macroeconomic instability and lack of further structural reforms appear to have been key factors in limiting the gains from trade liberalization by preventing economic restructuring and reallocation of resources. According to the IMF (1999), further banking sector reforms and continued economic restructuring were still necessary in order to sustain economic growth. The macroeconomic environment was hindered by the volatile price of oil, uncertainty regarding debt negotiations, and speculative attacks on the currency. As the government decreased expenditure under the structural adjustment program, domestic demand fell. During the late 1980s and early 1990s, the currency became overvalued again, thereby effectively offsetting trade liberalization measures. Non-trade barriers to competition also existed in the form of government monopolies and oligopolies that limited restructuring. Furthermore, the high interest rate aimed at preventing speculative attacks and attracting foreign capital, limited domestic demand and restructuring (Gonzalez). The Mexican economy improved between 1995-1998 (the end of our data) due to the implementation of structural reforms and the success of the floating exchange rate in mitigating the effect of external shocks (IMF, 1999).
Botswana	1979	1961-1998	Botswana is generally cited as an African success story. Since gaining independence in 1966, Botswana has had one of the fastest growth rates in the world (IMF, 2002). Botswana's income per capita (In PPP-adjusted terms in 1998) was 4 times the African average and the country grew at an annual rate of 7.7% between 1965 and 1998. (Rodrik, 2003). However, based on our data, Botswana experienced a mean growth difference of -1.99% (pre/post liberalization). This difference appears to be primarily due to the fact that Botswana experienced very high levels of growth prior to liberalization and greater dependence on volatile world diamond prices post liberalization. Another potential explanation may lie in the limitations of structural reform implemented in Botswana. Rodrik (2003) notes that despite trade liberalization and an export-oriented economy, government intervention has been high in Botswana and that the public sector accounts for a large share of the economy. Botswana's economy expanded when diamond mining began in 1971. The recession of 1981/1982 was partly due to a weak world diamond market. The late 1980s were a period of new mining activity and strong demand that supported overall economic growth. However, during the early to mid 1990s, recessionary conditions on the world diamond market led to a severe economic slump. Given that diamond exports account of (70%) of export earnings and more than one-third of GDP, volatile diamond prices have had a significant impact on the country's overall economic growth. However, despite the volatility, growth remained positive nearly the entire period. (IMF, 2002, EIU).

Country	Year of liberalization	Sample period	Policy Changes and Political Events
Israel	1985	1951-1998	In Israel, the wars of 1967 and 1973 limited economic growth. In 1977, both tariff and currency barriers were relaxed and in 1979, the government approved a five-year plan to reduce inflation and customs rates. In January, 1980, tariffs were further reduced on imports coming from the EEC. Israel invaded Lebanon in June 1982 and roughly a year later, Israel entered a deep economic crisis, with 3-digit inflation, an increasing trade gap, a rapidly mounting foreign debt, and significant real exchange rate appreciation. In July 1985, the government implemented an emergency economic stabilization plan in order to stop hyperinflation and signed a free trade agreement with the United States (Henry, 1999). Inflation dropped significantly in late 1985-1986 and the IMF announced its support for Israeli reform efforts. In 1986, Israel fixed the exchange rate to a trade-weighted currency basket. It devalued the currency 19%, along with other changes affecting the tax system and money markets in January 1987. Despite devaluations of the currency in 1988 and 1989, the interest rate increased because of the currency volatility. In 1991, Israel implemented a crawling band exchange rate system; the Shekel was devalued by 6% in order to boost the economy that was suffering due to the Gulf War. In November 1995, a Free Trade area Treaty affirming Israel's special trade status with the EU was signed (Henry, 1999). Despite Israel's trade reforms implemented throughout the period, Israel's heterodox stabilization program may have offset the effects of trade liberalization. Social pacts based on broad coalitions of labor, government, and industry, set the patterns for prices, wages, and the exchange rate (Wacziarg and Wallack). In addition, inflation, currency volatility, and high interest rates in the late 1980s and early 1990s reduced Israel's competitiveness and the gains from trade.
Philippines	1988	1951-1998	During the 1960s, the Marcos regime increased trade barriers that remained in effect until the 1980s. During an economic crisis in the early 1980s, the inflation rate increased significantly (1983 -1986); the currency was devalued by 50% in 1984; and expansionary monetary policy limited capital inflow and economic growth. The Philippines secured debt rescheduling agreements between 1985 and 1988 and the IMF approved a stabilization plan in 1989. In 1986 (the end of the Marcos era), the Philippines implemented trade liberalization measures, including lifting import restrictions. However, while the Philippines implemented trade reforms, government investment in state-owned enterprises roughly doubled during the sample time period, as did SOEs' percentage of total economic activity, employment, and net financial flows (Wacziarg and Wallack, 2003). The Philippines implemented capital market liberalization, including on the foreign exchange rate, in 1992. The IMF approved the country's economic performance and rescheduled additional debt. Further trade reforms, including removing quantitative restrictions, were also implemented during the early 1990s. (Henry, 1999). Despite further trade liberalization measures, the Philippines has not witnessed the increased economic growth experienced in other countries following liberalization. It appears that the limited structural reforms and persisting high level of government involvement in SOEs may be a limiting factor. In addition, Pritchett (2003) cites the institutional uncertainty that arose from the political instability in the Philippines following liberalization as a factor that may have limited investment and economic growth.

Country	Year of liberalization	Sample period	Policy Changes and Political Events
Colombia	1986	1951-1998	In December 1990, Colombia was unable to repay its debt principal payments and was unable to refinance its debt until April 1991. In the wake of this crisis, Colombia pursued a variety of market-oriented reforms in addition to further trade liberalization. Price controls were lifted, a financial sector reform was implemented, the exchange control system was liberalized, the regulatory framework was modernized, certain industries were privatized (Wacziarg and Wallack, 2003). Throughout the 1990s, further substantial trade reforms were implemented, including bilateral trading agreements with Latin American countries in 1993/1994 (Henry, 1999). However, 1992 marked a rise in civil unrest and political instability persisted throughout the 1990s. This factor likely limited Colombia's post-liberalization economic growth.
Countries with Positive Post-Liberalization Growth Changes			
Poland	1990	1971-1998	Poland's economy collapsed during the 1970s. In August 1980, the Solidarity movement began and a period of political unrest ensued. Martial law remained in effect through December 1982 before economic recovery began. In 1986, Poland was accepted into the IMF and began to pursue debt restructuring. However, in 1989, hyperinflation impeded economic growth and Poland's debt was still 74% of GDP (de Menil, 2003). In 1990, the government implemented a swift and comprehensive set of market reforms, including trade liberalization, in order to stabilize the economy. The reforms of this "Balcerowicz Plan" included removal of price controls, reduction of government expenditure and investment, devaluation of the exchange rate, and removal of subsidies for energy (Wacziarg and Wallack, 2003). Trade liberalization measures included the liberalization and elimination of exchange controls, abolishing state trading monopolies and nearly all quotas and tariffs. In addition, currency was devalued by over 50% in January 1990 and then gradually depreciated based on a crawling peg until 1995 (de Menil, 2003). 1991 marked a deep recession; however Poland persisted in its liberalization program. Poland implemented a new IMF plan that included tax reform and continued privatization in 1993. During the mid-1990s, Poland continued to implement reforms, including currency reform, privatizations, and policies to promote FDI. Poland applied for EU membership in 1994 and became an OECD member in 1996 (EIU). According to de Menil (2003), productivity gains appear to have been the primary factors in Poland's growth during the 1990s. He cites that the comprehensive structural reforms facilitated an economic transformation, reallocation of resources, and rapid adoption of "Western principles of management and standards of efficiency."
Ghana	1985	1956-1998	Upon gaining independence in 1957, Ghana pursued a strategy of import substitution and implemented a series of restrictive trade policies, including increasing tariffs, NTBs, and exchange rate controls, along with establishing state-owned enterprises (SOEs). By 1966, the currency was overvalued and a cycle of political instability (including military coups) and increasing inflation followed by currency devaluations ensured during the late 1960s and 1970s (Leith and Lofchie, 1993). Another economic crisis occurred in 1982 in which inflation increased and foreign exchange reserves dropped to very low levels. In 1983, the government launched a 4-year economic recovery program that included restructuring the

Country	Year of liberalization	Sample period	Policy Changes and Political Events
			physical infrastructure and economic institutions, and decreasing inflation through prudent monetary, fiscal, and trade policies. The 1985 trade liberalization program was part of the Rawlings administration's World Bank and IMF-supported Economic Recovery Program. Multiple exchange rates were initially implemented to promote exports, then unified and subjected to a series of devaluations. Public sector employment (including in state-owned enterprises) was cut and distortions in wages reduced (Wacziarg and Wallack, 2003). Ghana continued to implement trade and capital market reforms through the late 1980s and 1990s.
Uganda	1988	1951-1998	The period from when Uganda gained its independence in 1962 through 1980 was a period of economic devastation due to mismanagement and war in which capital was destroyed and manufacturing operated at extremely low capacity. Uganda implemented an IMF reform program in 1981. This program included measures such as floating the currency, removing price controls and fiscal austerity. The reform program was initially successful, but the success was not sustained and the IMF withdrew its support in 1984, a year which marked the beginning of a period of economic collapse and civil war (EIU). In 1985, policies to promote FDI and liberalize the foreign exchange market were implemented. A new economic recovery program launched in 1987. However, political unrest occurred in 1987, which led to a tightening of the capital market. In 1988, further trade and capital market liberalization measures resumed and were followed by banking reforms and overall privatization between 1989 and 1992. In 1993/1994, further trade and capital market liberalization measures were implemented, including the liberalization of the interest rate (EIU). A variety of different currency regimes were implemented between 1988 and 1992 and, at different times, the currency was pegged to the US dollar and a composite of other currencies before a flexible exchange rate system was implemented in 1996 (Amvouna, 1998).
Taiwan	1963	1952-1998	While the majority of countries in this sub-sample implemented trade liberalization in the wake of economic and often political crises as well, Taiwan had a stable economic environment and relatively low tariff rates at the time of liberalization. Trade liberalization in the early 1960s involved further tariff reductions along with incentives to attract FDI, including establishing EPZs. (Sakuarai, 1995). Between 1985 and 1987, trade liberalization involved further reductions in tariffs and NTBs. In 1985, Taiwan implemented polices to promote FDI and liberalize the foreign exchange market. In 1987, capital controls were tightened. However, Taiwan implemented capital market reform measures along with additional trade reform measures in 1988. Taiwan implemented banking reforms and overall privatization measures through 1989-1992 (Henry, 1999).
Chile	1976	1952-1998	When Allende assumed power in 1970, he nationalized copper mines, banks and other industries. Government expenditure increased dramatically; the country's budget deficit rose from 2.7% of GDP to 25% between 1970 and 1973. The currency black market premium exceeded 600% in 1972 and inflation exceeded 100% in 1973 (Easterly and Sewadeh, 2000, Stallings and Brock, 1993). In 1973, Pinochet overthrew Allende in a military coup that marked a significant change in policy. Between 1975 and 1982, structural changes to liberalize the financial system were implemented. Quantitative restrictions were eliminated

Country	Year of liberalization	Sample period	Policy Changes and Political Events
			in 1973; tariffs were significantly reduced between 1973 and 1979 when they were set at a uniform rate of 10%. In 1979, the exchange rate was fixed to the US$, capital controls reduced, the tax system simplified and privatization pursued (Stallings and Brock, 1993). Trade reform in the early years of the pro-market Pinochet administration was accompanied by privatization, elimination of the fiscal deficit, and lifting of price and interest rate controls. Liberalization of the labor market also facilitated overall economic restructuring (Wacziarg and Wallack, 2003). In 1980/81, Chile privatized its social security system and implemented banking reforms. However, Chile experienced an economic crisis during the Latin American debt crisis. Chile was unable to access credit markets and the government intervened and assumed control of troubled banks. In 1982, GDP fell 14% and inflation doubled. Between 1982 and 1985, the peso was devalued, tariff rates increased to 35%, and the country reversed privatization (Stallings and Brock, 1993). In 1985, the peso was gradually depreciated with a crawling peg, tariffs were lowered to 15%, and privatization resumed. During the mid to late 1980s, Chile decreased tariffs, rescheduled its debt, and re-privatized the banking sector. During the 1990s, Chile implemented free trade agreements with Mexico and Colombia and implemented substantial capital market liberalization (Henry, 1999).
Korea	1968	1954-1998	Political turmoil in South Korea in the late 1950s forced President Rhee's resignation in 1960. This was followed by a military coup in 1961 and continued political unrest; inflation increased and foreign exchange reserves decreased significantly before Korea stabilized and started its slow transition to democratic rule in 1964 (Haggard, Cooper, and Moon, 1993). Korea transitioned from a policy of import substitution to export-oriented growth during the mid-1960s. Tariffs and NTBs were reduced and the government created export processing zones (EPZs) and other means of increasing FDI (Sakuarai, 1995). The currency was devalued, the tax system and interest rates reformed, and capital markets liberalized. In 1965, the export development committee was established and in 1966, quantitative restrictions were eliminated. However, liberalization was not universal; certain sectors remained protected, and government involvement in the economy remained pervasive. President Park was assassinated in November 1979, which was followed by a year of political/economic crisis. In 1980, significant banking reforms were announced and in 1981, a 5-yr economic plan of structural adjustment was initiated. While economic growth was dampened during the financial crisis in 1982-84, capital and banking sector reforms were implemented in 1984. Further trade reforms were implemented in the mid-late 1980s, including tariff and NTB reductions. Banking and capital market reforms were deepened in 1991 in an effort to attract FDI and in 1993, a five-year plan for reform and further financial system regulation was implemented (Henry, 1999).
Indonesia	1970	1961-1998	During the early 1960s, Indonesia suffered an economic crisis, with high budget deficits and inflation up to 640%. In March, 1966, under pressure from the army President Sukarno transferred some power to Soeharto; in March 1967 Soeharto was named President. A 5 -year development plan to stabilize the economy and promote growth was implemented which successfully stabilized the economy. Capital market liberalization occurred in 1970. In February 1976, the government reduced the 10% export duty on a

Country	Year of liberalization	Sample period	Policy Changes and Political Events
			wide range of commodities. However, during the 1970s, government intervention increased despite trade liberalization reforms being implemented. The government increased its control of state-owned banks and other SOEs. Oil revenue was significant during the 1970s, however, economic growth weakened in the early 1980s due in part to falling oil prices. However, the impact was mitigated by the country's "swift adjustment and a debt burden that was lower than elsewhere." (Temple, 2004). In June 1983, the Government announced a series of bank liberalization reforms, followed by further reforms in 1988 when credit subsidies were removed (Temple, 2003). Devaluations occurred in 1983 and 1986. During 1984/1985, Indonesia entered into bilateral trading agreements with the Soviet Union, the U.S., and several other countries. In May 1986, the government announced new measures to attract foreign investment. The oil market crashed in the second quarter of 1986. During 1986, further trade and investment liberalization measures were implemented; QRs and NTBs were gradually removed. The government implemented a wide-scale privatization program during the late 1980s and early 1990s. Between 1991 and 1995, the government implemented banking reforms to strengthen the system, but later weakened regulations to stimulate lending. During 1991 to 1995, capital market reforms aimed at improving stock exchange were implemented (Henry, 1999, EIU).

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Table 1 – Countries that were classified as closed in 1970-1989 period, and as open in the 1990-99 period

Argentina	Ecuador	Kenya	Peru
Benin	Egypt, Arab Rep.*	Madagascar*	Philippines
Bolivia	El Salvador	Mali	Poland
Botswana	The Gambia	Mauritania	South Africa
Brazil	Ghana	Mexico	Sri Lanka
Burkina Faso*	Guatemala	Morocco	Trinidad and Tobago*
Cameroon	Guinea	Mozambique*	Tunisia
Chile	Guinea-Bissau	New Zealand	Turkey
Colombia	Honduras	Nicaragua	Uganda
Costa Rica	Hungary	Niger*	Uruguay
Côte d'Ivoire*	Israel	Paraguay	Venezuela*
Dominican Republic*	Jamaica		

(* denotes countries that were still classified as closed by SW as late as 1994)

Table 2 – Countries not classified in SW, and their 1990-1999 status

Open in 1990-1999		**Closed in 1990-1999**
Albania	Lesotho	Belarus
Armenia	Lituania	Croatia
Azerbaijan	Macedonia, FYR	Estonia
Bulgaria	Malta	Kazakhstan
Cape Verde	Moldova	Liberia
Czech Republic	Panama	Romania
Georgia	Slovak Republic	Russian Federation
Iceland	Slovenia	Turkmenistan
Kyrgyz Republic	Swaziland	Ukraine
Latvia	Tajikistan	Uzbekistan

Table 3 – Dates of Liberalization of Countries that Liberalized since 1994 or were not included in the SW list of liberalization dates

	Date of Liberalization
Cape Verde	1991*
Dominican Republic	1992**
Trinidad and Tobago	1992**
Côte d'Ivoire	1994**
Niger	1994**
Mauritania	1995**
Egypt, Arab Rep.	1995
Mozambique	1995
Tanzania	1995
Armenia	1995
Azerbaijan	1995
Bangladesh	1996
Ethiopia	1996
Madagascar	1996
Venezuela	1996
Georgia	1996
Panama	1996*
Tajikistan	1996
Burkina Faso	1998
Burundi	1999
Pakistan	2001
Sierra Leone	2001
Yugoslavia, FR (Serbia/Montenegro)	2001

(* Not classified in SW; ** Disagreement with SW – see text for explanations)

Table 4 - Countries that Remained Closed as of 2001

Algeria	Iceland *	Russian Federation
Angola	India**	Rwanda
Belarus**	Iran, Islamic Rep.	Senegal
Central African Republic	Iraq	Somalia
Chad	Kazakhstan	Swaziland*
China	Lesotho*	Syrian Arab Republic
Congo, Dem. Rep.	Liberia*	Togo
Congo, Rep.	Malawi	Turkmenistan
Croatia**	Malta*	Ukraine
Estonia**	Myanmar	Uzbekistan
Gabon	Nigeria	Zimbabwe
Haiti	Papua New Guinea	

(* Not classified in SW; ** Disagreement with SW – see text for explanations)

Table 5 – Replication of the SW 1970-1989 regressions using Penn World Tables 6.0 Data (Table 11 in SW 1995)

Dep. Var: Growth 1970-1998	(1)	(2)	(3)	(4)	(5)	(6)	(7)
LRGDPCH70	0.5038	-1.4491	0.0123	-1.5681	-1.5960	-1.6262	-1.5929
	(2.23)	(5.59)	(0.04)	(4.46)	(4.93)	(5.09)	(4.89)
LIBER_SW_1970-89					**2.2277**	**2.0226**	**1.9845**
					(4.49)	**(4.03)**	**(3.87)**
POL						-0.7500	-0.6974
						(1.82)	(1.66)
SEC70				3.2580	0.8967	0.6794	0.8059
				(2.84)	(0.76)	(0.58)	(0.68)
PRI70				0.9546	1.6132	1.4877	1.4003
				(1.07)	(1.92)	(1.79)	(1.65)
GVXDXE7084				-0.0969	-0.0836	-0.0841	-0.0844
				(3.32)	(3.05)	(3.11)	(3.02)
REVCOUP7085				-0.8773	-1.0239	-0.4467	-0.4359
				(1.19)	(1.51)	(0.60)	(0.58)
ASSASS7085				-0.1050	-0.0066	0.0249	0.0296
				(0.42)	(0.03)	(0.11)	(0.13)
PPI70DEV				-0.1585	-0.2552	-0.1983	-0.1709
				(0.46)	(0.80)	(0.63)	(0.53)
INV7089				0.1098	0.0733	0.0823	0.0757
				(3.92)	(2.72)	(3.04)	(2.64)
DENSI60							0.0006
							(0.90)
Intercept	-2.6772	16.2669	0.4560	11.7471	11.9772	12.4662	12.2482
	(1.46)	(7.00)	(0.20)	(4.34)	(4.80)	(5.03)	(4.87)
Adj. R^2	0.034	0.502	-0.014	0.438	0.540	0.552	0.546
# of Obs.	115	31	74	96	93	93	91

(Absolute values of t-statistics in parentheses)
Column 2: Sample of open economies according to the SW dummy for 1970-89
Column 3: Sample of closed economies according to the SW dummy for 1970-89

Table 6 – Replication of the SW cross-sectional regressions using the updated openness dummy for the 1990-1999 decade

Dep. Var: Growth 1990-1998	(1)	(2)	(3)	(4)	(5)	(6)	(7)
LRGDPCH89	0.564	0.646	-1.452	-1.266	-1.141	-1.112	-1.150
	(2.33)	(3.38)	(1.38)	(2.35)	(2.07)	(1.88)	(1.95)
LIBER_WW_1990-99					**0.050**	**0.025**	**0.136**
					(0.08)	**(0.04)**	**(0.21)**
POL						0.180	0.165
						(0.30)	(0.28)
SEC85				4.437	4.165	4.328	4.689
				(2.46)	(2.34)	(2.25)	(2.43)
PRI85				1.153	1.350	1.271	1.381
				(0.75)	(0.89)	(0.78)	(0.86)
CG8998				-0.089	-0.081	-0.081	-0.063
				(2.04)	(1.85)	(1.74)	(1.32)
REVOL8998				-1.078	-0.834	-0.836	-0.986
				(1.21)	(0.95)	(0.92)	(1.08)
ASSASS8998				0.503	0.444	0.452	0.483
				(1.64)	(1.47)	(1.46)	(1.56)
PPI89DEV				-0.746	-0.723	-0.695	-0.734
				(1.28)	(1.26)	(1.17)	(1.24)
INV8998				0.091	0.078	0.078	0.051
				(2.00)	(1.75)	(1.66)	(1.01)
DENSI80							0.0009
							(1.40)
Intercept	-3.53	-3.978	11.030	9.207	8.139	7.835	7.752
	(1.73)	(2.39)	(1.39)	(2.40)	(2.13)	(1.82)	(1.81)
R^2	0.037	0.119	0.034	0.248	0.217	0.201	0.211
# of obs.	116	78	27	94	93	89	89

(Absolute values of t-statistics in parentheses)
Column 2: Sample of open economies according to the openness dummy for 1990-99
Column 3: Sample of closed economies according to the openness dummy for 1990-99

Table 7 - Replication of the SW cross-sectional regressions for each decade using the date-based openness indicator for 1970, 1980 and 1989.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable:	**Growth 1970-80**		**Growth 1980-89**		**Growth 1989-98**	
LRGDPCH(t)	-1.395	-1.292	-1.231	-1.397	-1.221	-1.261
	(3.09)	(2.83)	(3.39)	(3.84)	(2.21)	(2.13)
LIBER_(t)	**1.206**	**1.387**	**2.643**	**2.574**	**0.338**	**0.521**
	(1.82)	**(1.86)**	**(4.47)**	**(4.17)**	**(0.59)**	**(0.84)**
SEC(t)	1.020	0.169	1.261	1.822	4.243	4.872
	(0.60)	(0.10)	(0.98)	(1.40)	(2.39)	(2.52)
PRI(t)	3.333	2.455	0.413	-0.139	1.510	1.616
	(2.85)	(2.01)	(0.33)	(0.11)	(0.98)	(0.99)
CG(t, t+10)	-0.016	-0.005	-0.070	-0.065	-0.077	-0.059
	(0.61)	(0.19)	(2.65)	(2.51)	(1.76)	(1.26)
REVOL(t, t+10)	-1.914	-1.238	-0.739	-0.211	-0.851	-1.030
	(1.87)	(1.12)	(0.79)	(0.21)	(0.97)	(1.13)
ASSASS(t, t+10)	0.153	0.276	0.182	0.188	0.433	0.473
	(0.52)	(0.94)	(0.52)	(0.54)	(1.43)	(1.54)
PPIDEV(t)	-0.498	-0.476	0.366	0.350	-0.708	-0.721
	(1.04)	(0.99)	(0.89)	(0.87)	(1.24)	(1.23)
INV(t, t+10)	0.075	0.076	0.113	0.103	0.072	0.040
	(2.13)	(2.02)	(2.77)	(2.30)	(1.59)	(0.76)
POL		-0.907		-0.780		0.224
		(1.47)		(1.51)		(0.38)
DENSI(t-10)		0.001		0.001		0.001
		(0.60)		(0.87)		(1.49)
Intercept	9.441	9.334	8.865	10.635	8.511	8.288
	(2.94)	(2.84)	(3.30)	(3.86)	(2.21)	(1.92)
R^2	0.33	0.35	0.49	0.53	0.30	0.32
# of Obs.	106	99	101	97	93	89

(Absolute value of t-statistics in parentheses)
(t) denotes the beginning date of each period – 1970-1980, 1980-89, 1989-98.
(t, t+10) denotes the average computed between dates t and t+10.

Table 8 - Seemingly unrelated regression (SUR) Estimates using three periods (1970-1980, 1980-1989, 1989-1998)

	(1) SUR	(2) SUR	(3) SUR	(4) SUR	(5) SUR - Iterated	(6) SUR - Period Dummies
LRGDPCH(t)	-0.155	-1.518	-1.612	-1.600	-1.616	-1.687
	(0.84)	(5.07)	(5.36)	(5.34)	(5.40)	(5.70)
LIBER_SW_(t)	**1.988**	**1.247**	**1.214**	**1.363**	**1.407**	**1.330**
	(5.61)	**(3.54)**	**(3.33)**	**(3.61)**	**(3.73)**	**(3.52)**
POL			-0.721	-0.833	-0.872	-0.708
			(1.96)	(2.20)	(2.28)	(1.89)
SEC(t)		2.418	2.398	2.312	2.271	3.237
		(2.36)	(2.34)	(2.21)	(2.16)	(3.05)
PRI(t)		1.497	1.203	1.130	1.055	1.748
		(1.77)	(1.42)	(1.34)	(1.25)	(2.10)
CG(t, t+10)		-0.066	-0.054	-0.044	-0.044	-0.038
		(3.28)	(2.71)	(2.19)	(2.21)	(1.92)
REVOL(t, t+10)		-1.317	-1.015	-1.011	-1.004	-1.043
		(2.40)	(1.80)	(1.78)	(1.77)	(1.89)
ASSASS(t, t+10)		0.237	0.236	0.275	0.268	0.242
		(1.28)	(1.30)	(1.51)	(1.47)	(1.36)
PPIDEV(t)		0.213	0.148	0.148	0.168	0.088
		(0.72)	(0.51)	(0.51)	(0.58)	(0.31)
INV(t, t+10)		0.106	0.109	0.094	0.095	0.066
		(4.48)	(4.63)	(3.76)	(3.82)	(2.53)
DENSI(t-10)				0.001	0.001	0.001
				(1.57)	(1.53)	(2.13)
Intercept7080						12.828
						(6.01)
Intercept8089						11.253
						(5.28)
Intercept8998						11.802
						(5.58)
Intercept	1.901	10.979	11.944	11.842	12.006	
	(1.30)	(5.22)	(5.50)	(5.50)	(5.57)	
R^2	-0.106	0.199	0.245	0.248	0.241	0.349
	0.195	0.400	0.433	0.461	0.470	0.511
	0.049	0.190	0.166	0.171	0.164	0.203
# of Obs	103	89	86	83	83	83

(Absolute values of t-statistics in parentheses)
(t) denotes the beginning date of each period – 1970-1980, 1980-89, 1989-98.
(t, t+10) denotes the average computed between dates t and t+10.

Table 9 - SUR Estimates of the period-by-period (unconstrained) relationship (estimates allowed to differ across periods)

	t=1970	t=1980	t=1989
	SUR	**SUR**	**SUR**
LRGDPCH(t)	-1.430	-2.045	-1.625
	(3.08)	(5.30)	(2.81)
LIBER_SW_(**t**)	**1.327**	**2.889**	**0.327**
	(1.85)	**(4.79)**	**(0.55)**
POL	-0.847	-0.986	0.029
	(1.48)	(1.89)	(0.05)
SEC(t)	-0.291	3.303	5.944
	(0.17)	(2.24)	(3.21)
PRI(t)	3.829	0.110	1.394
	(3.26)	(0.09)	(0.85)
CG(t, t+10)	-0.023	-0.036	-0.066
	(0.87)	(1.36)	(1.40)
REVOL(t, t+10)	-1.387	-1.014	-0.965
	(1.38)	(1.11)	(1.16)
ASSASS(t, t+10)	0.183	0.433	0.409
	(0.70)	(1.40)	(1.43)
PPIDEV(t)	-0.072	0.423	-0.695
	(0.15)	(1.14)	(1.21)
INV(t, t+10)	0.071	0.080	0.033
	(2.07)	(1.93)	(0.67)
DENSI(t-10)	0.001	0.001	0.001
	(0.58)	1.35	1.71
Intercept	10.149	14.852	11.431
	(3.16)	5.21	2.79
R^2	0.410	0.584	0.285
# of Obs	83	83	83

(Absolute values of t-statistics in parentheses)
(t) denotes the beginning date of each period – 1970-1980, 1980-89, 1989-98.
(t, t+10) denotes the average computed between dates t and t+10.

Table 10 - Summary Statistics for the variables used in fixed-effects regressions

Variable	Obs.	Mean	Std.Dev.	Min	Max
Liberalization	7191	0.317	0.465	0.000	1.000
Investment Rate	5078	15.291	9.128	-3.590	52.880
Openness ratio	5078	60.505	42.880	3.110	473.860
Growth	4936	1.784	6.153	-48.732	43.754
Per capita GDP	5072	5739.380	5826.636	276.000	39129.000

Table 11 - Fixed Effects Regressions of Growth on Liberalization Status, 1950-1998 (specification of equation (1))

Dep. Var: Growth	(1)	(2)	(3)	(4)
	1950-1998	1950-1970	1970-1990	1990-1998
	Country Fixed Effects			
Liberalization	0.557	0.901	1.090	3.444
	(2.26)	(1.95)	(1.72)	(4.10)
# of obs.	4936	1728	2312	1116
# of countries	133	108	112	133
R^2	0.015	0.010	0.034	0.035
	Country Fixed Effects with Trend			
Liberalization	1.697	0.656	2.192	2.574
	(6.11)	(1.37)	(3.38)	(2.88)
Year	-0.065	0.052	-0.143	0.206
	(8.68)	(1.97)	(6.68)	(2.76)
# of obs.	4936	1728	2312	1116
# of countries	133	108	112	133
R^2	0.037	0.010	0.053	0.044
	Country and Year Fixed Effects*			
Liberalization	1.417	0.611	1.787	2.547
	(4.98)	(1.29)	(2.71)	(2.85)
# of obs.	4936	1728	2312	1116
# of countries	133	108	112	133
R^2	0.070	0.042	0.076	0.060

(Absolute values of t-statistics in parentheses)
* output for year dummies omitted.

Table 12 - Fixed Effects Regressions of the Investment Rate on Liberalization Status, 1950-1998 (specification of equation (2))

Dep. Var: Investment rate	(1)	(2)	(3)	(4)
	1950-1998	1950-1970	1970-1990	1990-1998
	Country Fixed Effects			
Liberalization	1.233	3.026	-0.381	1.215
	(6.62)	(10.87)	(0.94)	(3.52)
# of obs.	5078	1844	2321	1140
# of countries	136	110	117	136
R^2	0.142	0.141	0.235	0.114
	Country Fixed Effects with Trend			
Liberalization	1.595	2.451	1.130	0.731
	(7.56)	(8.62)	(2.84)	(1.98)
Year	-0.021	0.115	-0.196	0.114
	(3.63)	(7.59)	(14.90)	(3.60)
# of obs.	5078	1844	2321	1140
# of countries	136	110	117	136
R^2	0.011	0.088	0.103	0.067
	Country and Year Fixed Effects*			
Liberalization	1.937	2.545	1.237	0.762
	(9.06)	(8.92)	(3.06)	(2.05)
# of obs.	5078	1844	2321	1140
# of countries	136	110	117	136
R^2	0.118	0.096	0.110	0.066

(Absolute values of t-statistics in parentheses)
* output for year dummies omitted.

Table 13 – Fixed-Effects Regressions of Growth on the Investment Rate, 1950-1998

Dep. Var.: Growth, 1950-1998	(1)	(2)	(3)
	Country fixed effects	Country fixed effects with trend	Country and year fixed effects
Investment rate	0.162	0.160	0.151
	(8.71)	(8.63)	(8.05)
year	-	-0.043	-
		(6.45)	
# Obs.	4936	4936	4936
# Countries	133	133	133
R^2	0.052	0.087	0.061

(Absolute values of t-statistics in parentheses)

Table 14 - Fixed Effects Regressions of Openness (trade to GDP ratio) on Liberalization Status, 1950-1998 (specification of equation (3))

Dep. Var: Openness	(1)	(2)	(3)	(5)
	1950-1998	1950-1970	1970-1990	1990-1998
	Country Fixed Effects			
Liberalization	14.844	2.834	6.475	4.149
	(21.45)	(3.42)	(4.88)	(2.40)
# of obs.	5078	1844	2321	1140
# of countries	136	110	117	136
R^2	0.061	0.012	0.087	0.013
	Country Fixed Effects with Trend			
Liberalization	5.176	2.396	2.295	-1.649
	(7.09)	(2.79)	(1.73)	(0.92)
Year	0.549	0.087	0.542	1.370
	(27.99)	(1.92)	(12.36)	(8.89)
# of obs.	5078	1844	2321	1140
# of countries	136	110	117	136
R^2	0.079	0.015	0.027	0.004
	Country and Year Fixed Effects*			
Liberalization	5.531	2.302	4.097	-1.803
	(7.42)	(2.67)	(3.12)	(1.01)
# of obs.	5078	1844	2321	1140
# of countries	136	110	117	136
R^2	0.083	0.013	0.045	0.005

(Absolute values of t-statistics in parentheses)

* output for year dummies omitted.

Table 15 - Timing of the Effects of Liberalization on Growth, Investment and Openness: Fixed-effects regressions (specification of Equation (4))

	(1)	(2)	(3)
	Dependent Variable: Growth		
D1	-1.629	-0.768	-0.555
	(3.56)	(1.62)	(1.16)
D2	-0.553	0.483	0.300
	(1.22)	(1.01)	(0.62)
D3	0.835	2.043	1.438
	(1.91)	(4.32)	(2.97)
D4	-0.482	1.487	1.015
	(1.33)	(3.14)	(2.13)
Year		-0.062	
		(6.43)	
# of obs.	4230	4230	4230
# of countries	118	118	118
R-squared	0.01	0.02	0.06
	Dependent Variable: Investment Rate		
D1	-1.791	-1.607	-1.040
	(5.22)	(4.49)	(2.91)
D2	-0.858	-0.638	-0.160
	(2.52)	(1.76)	(0.44)
D3	0.739	0.996	1.197
	(2.25)	(2.78)	(3.31)
D4	1.984	2.399	2.129
	(7.35)	(6.79)	(6.07)
Year		-0.013	
		(1.82)	
# of obs.	4357	4357	4357
# of countries	121	121	121
R-squared	0.03	0.03	0.09
	Dependent Variable: Openness Ratio		
D1	4.678	-2.749	-1.979
	(3.65)	(2.16)	(1.54)
D2	8.438	-0.472	0.795
	(6.63)	(0.37)	(0.61)
D3	12.216	1.855	3.606
	(9.95)	(1.46)	(2.77)
D4	28.777	12.044	13.371
	(28.55)	(9.58)	(10.61)
Year		0.525	
		(20.62)	
# of obs.	4357	4357	4357
# of countries	121	121	121
R-squared	0.17	0.24	0.27

(Absolute value of t statistics in parentheses)
Column (1): Country fixed-effects. Column (2): Country fixed-effects with a time trend;
Column (3): Country and year fixed-effects.

Table 16 – Fixed Effects Regressions – Excluding the year of and the three years around liberalization

Dep. Var: Growth, 1950-1998	Excludes the year of liberalization			Excludes 3 years around liberalization		
	(1)	(2)	(3)	(4)	(5)	(6)
Liberalization	0.786	2.008	1.717	0.641	1.837	1.561
	(3.11)	(7.07)	(5.90)	(2.35)	(5.93)	(4.90)
Year	-	-0.069	-	-	-0.064	-
		(9.14)			(8.00)	
# of obs.	4827	4827	4827	4558	4558	4558
# of countries	133	133	133	133	133	133
R^2	0.018	0.040	0.075	0.018	0.036	0.069

(Absolute values of t-statistics in parentheses) - Columns (3) and (6) include year fixed-effects.

Table 17 – Sample splits between trade reformer, overall reformers and counteractor countries (1950-1998 period)

Dep. Var: Growth 1950-1998	(1)	(2)	(3)
	Country fixed effects	Country fixed effects with trend	Country and year fixed effects
	Pooled Sample		
Liberalization	0.906	1.690	1.585
	(2.58)	(4.24)	(3.45)
Year	-	-0.052	-
		(4.04)	
# of obs.	959	959	959
# of countries	21	21	21
R^2	0.04	0.06	0.20
	Trade Reformers		
Liberalization	1.241	1.863	1.672
	(1.80)	(2.49)	(1.80)
Year	-	-0.049	-
		(2.04)	
# of obs.	331	331	331
# of countries	7	7	7
R^2	0.04	0.06	0.26
	Overall Reformers		
Liberalization	0.732	1.604	1.632
	(1.85)	(3.47)	(3.09)
Year	-	-0.054	-
		(3.57)	
# of obs.	628	628	628
# of countries	14	14	14
R^2	0.03	0.05	0.23

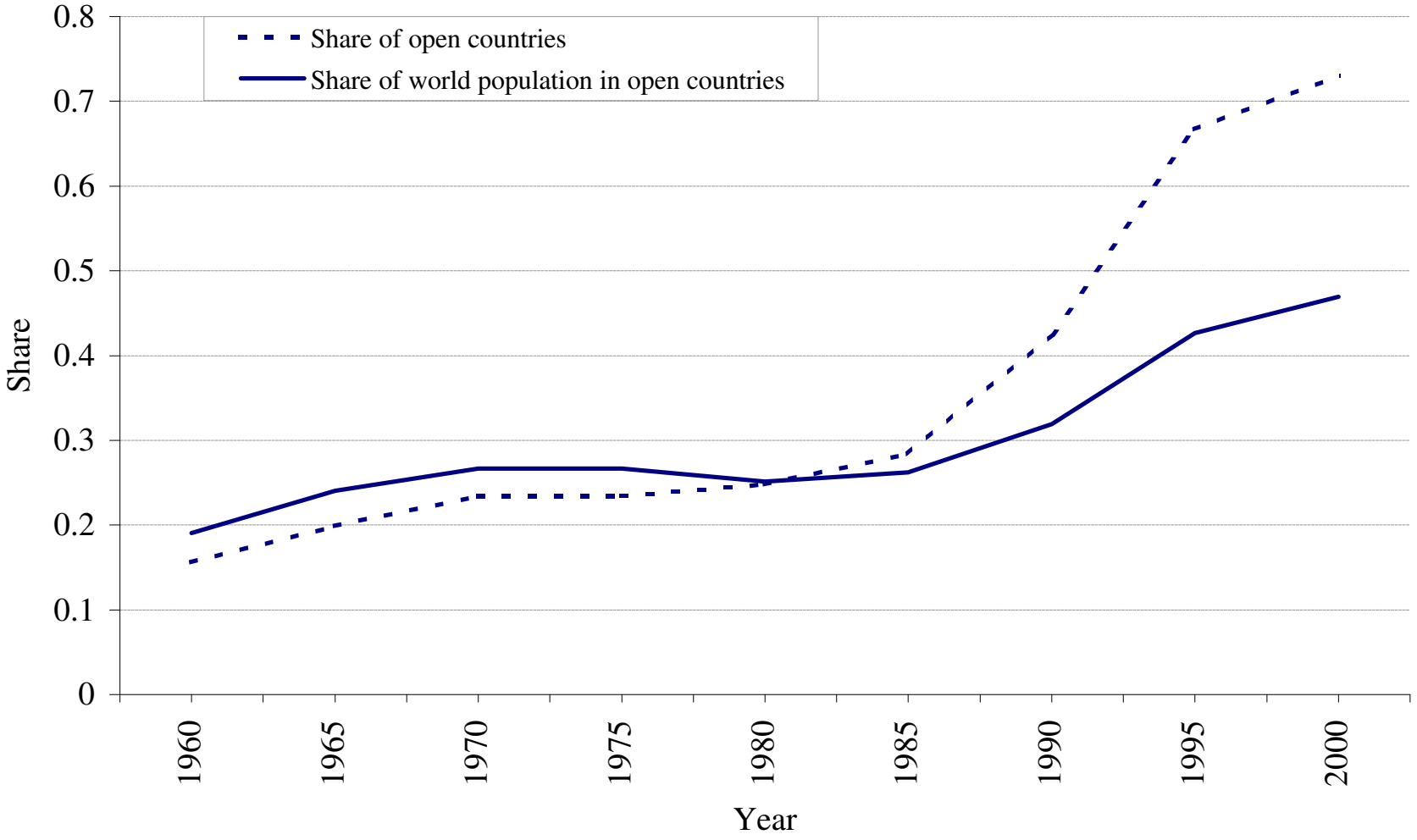
(Absolute values of t-statistics in parentheses)
Trade Reformers: Bolivia, El Salvador, Ghana, Kenya, Morocco, Trinidad & Tobago, Uruguay.
Overall Reformers: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Guatemala, Hungary, Mexico, New Zealand, Paraguay, Poland, Spain, Sri Lanka.

Table 18 – Mean Growth, Investment and Openness Changes in 24 Countries

country	Growth Difference	Investment Difference	Openness difference	year of liberalization	Sample period
Jordan	-4.28	5.75	40.61	1965	1955-1998
Guinea-Bissau	-2.95	5.59	9.89	1987	1961-1998
Hungary	-2.41	-1.19	-4.17	1990	1971-1998
Mexico	-2.16	-4.59	17.56	1986	1951-1998
Botswana	-1.99	3.98	22.27	1979	1961-1998
Israel	-0.96	-6.10	21.42	1985	1951-1998
Philippines	-0.40	1.03	39.54	1988	1951-1998
Tunisia	-0.30	-5.58	31.94	1989	1962-1998
Colombia	0.18	0.48	5.91	1986	1951-1998
Cyprus	0.34	-4.05	29.13	1960	1951-1996
Paraguay	0.42	2.01	49.71	1989	1952-1998
Poland	0.83	-4.30	3.35	1990	1971-1998
Mali	1.19	0.86	15.68	1988	1961-1998
Benin	1.74	1.64	8.72	1990	1960-1998
Guyana	1.80	-7.49	84.49	1988	1951-1998
Guinea	1.85	-2.74	7.28	1986	1960-1998
Ghana	1.99	-3.91	9.13	1985	1956-1998
Uganda	2.24	1.63	-6.60	1988	1951-1998
Taiwan	2.29	9.91	55.77	1963	1952-1998
Chile	2.80	-1.12	26.33	1976	1952-1998
Korea, Rep. of	3.02	18.44	43.40	1968	1954-1998
Uruguay	3.08	-1.01	11.22	1990	1951-1998
Indonesia	3.32	9.80	25.96	1970	1961-1998
Mauritius	3.62	0.34	35.90	1968	1951-1998

Note: In bold, 13 country cases discussed in detail in subsection 5.2. Countries are entered in increaseing order of the growth difference.

Figure 1 - Openness in the World (Sachs and Warner Criteria) - 141 countries.



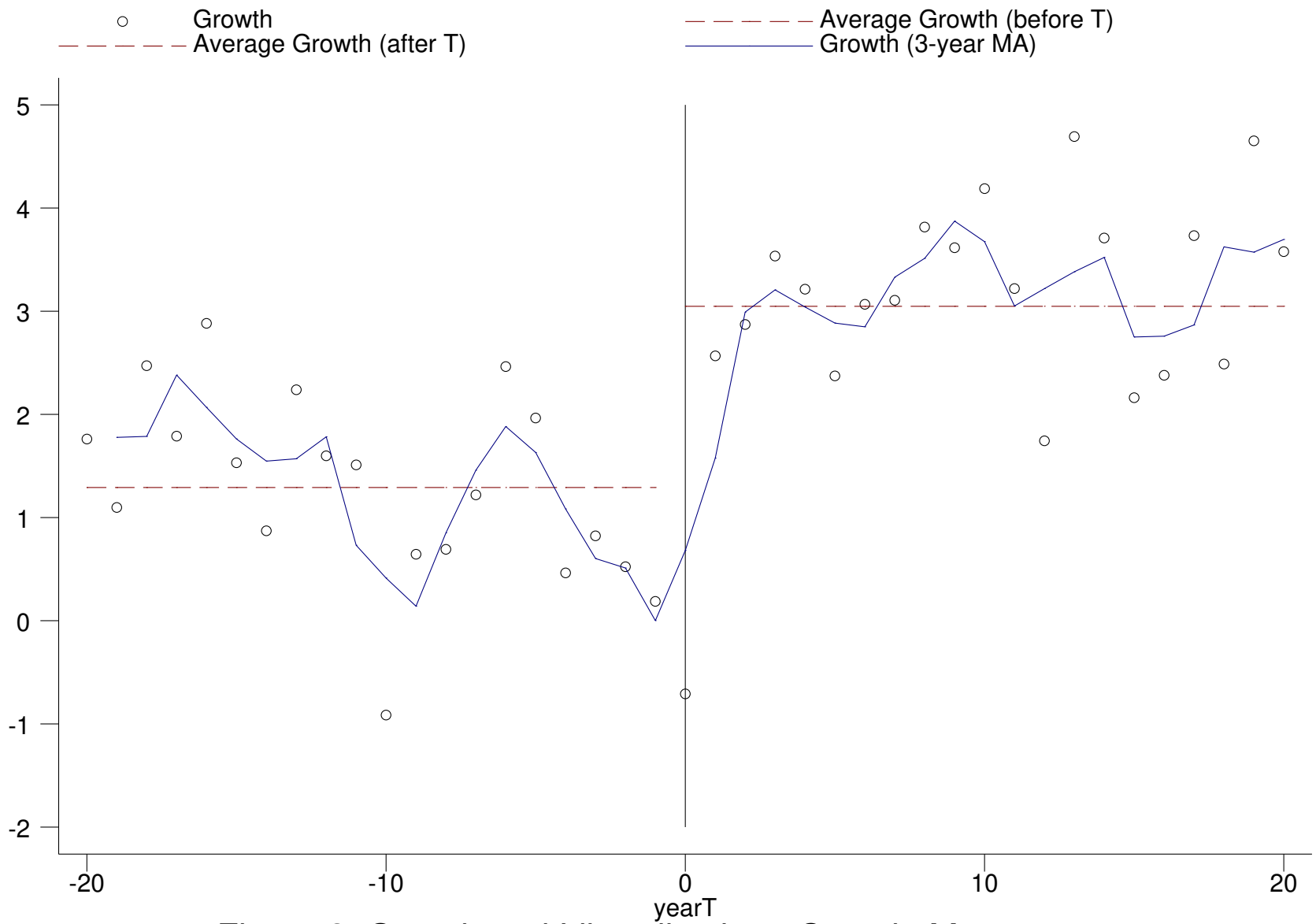


Figure 2. Growth and Liberalization - Sample Means

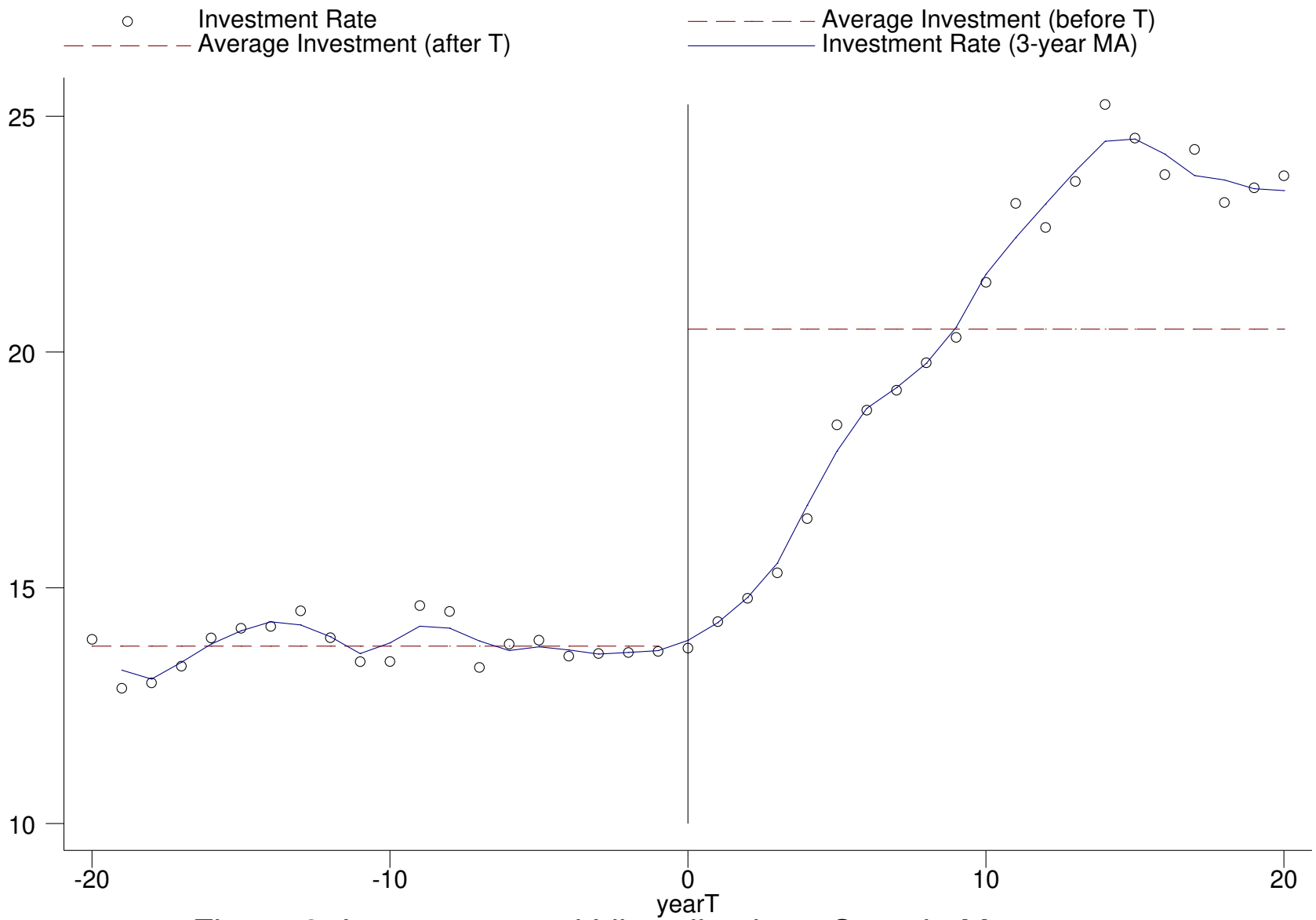


Figure 3. Investment and Liberalization - Sample Means

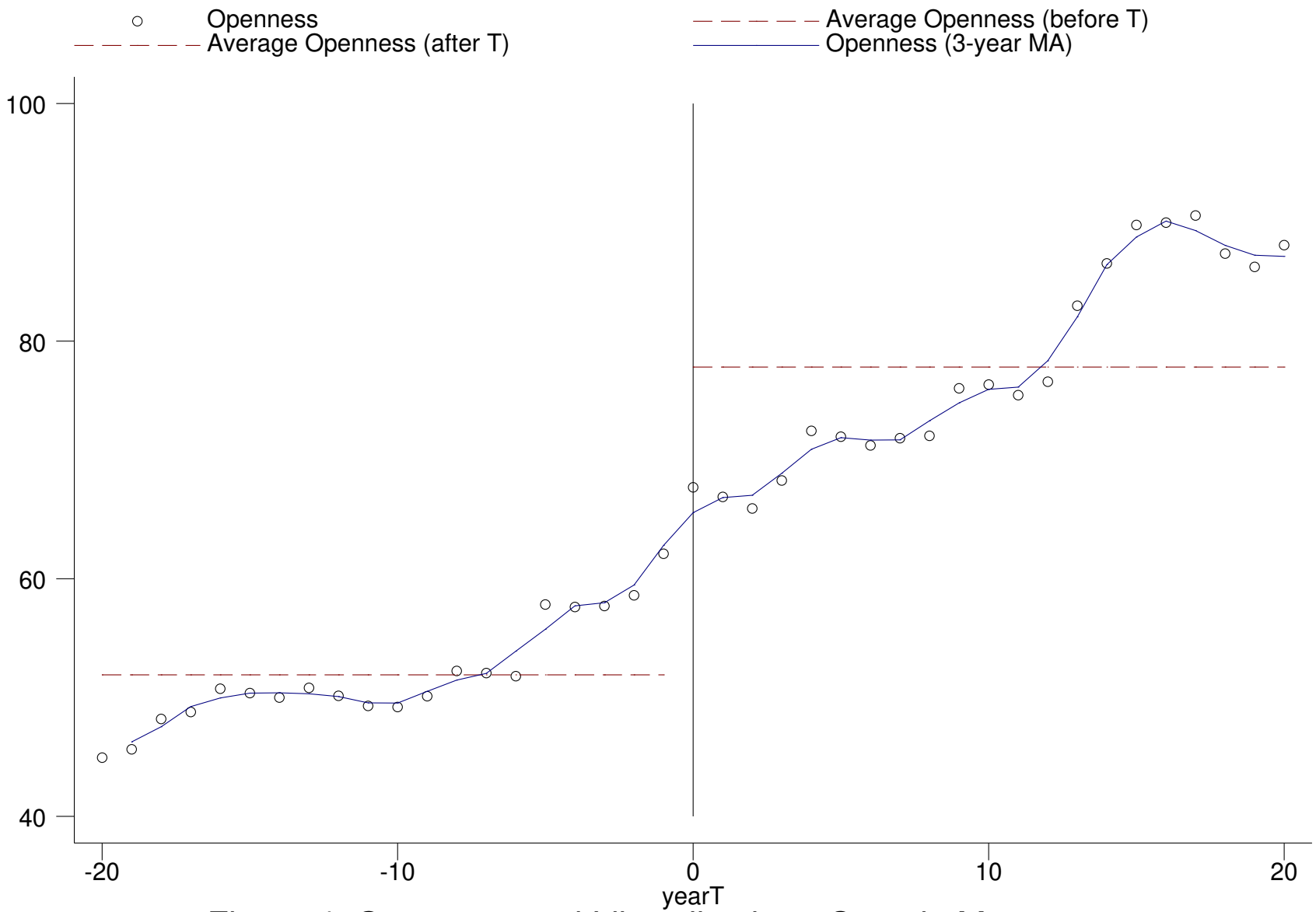


Figure 4. Openness and Liberalization - Sample Means

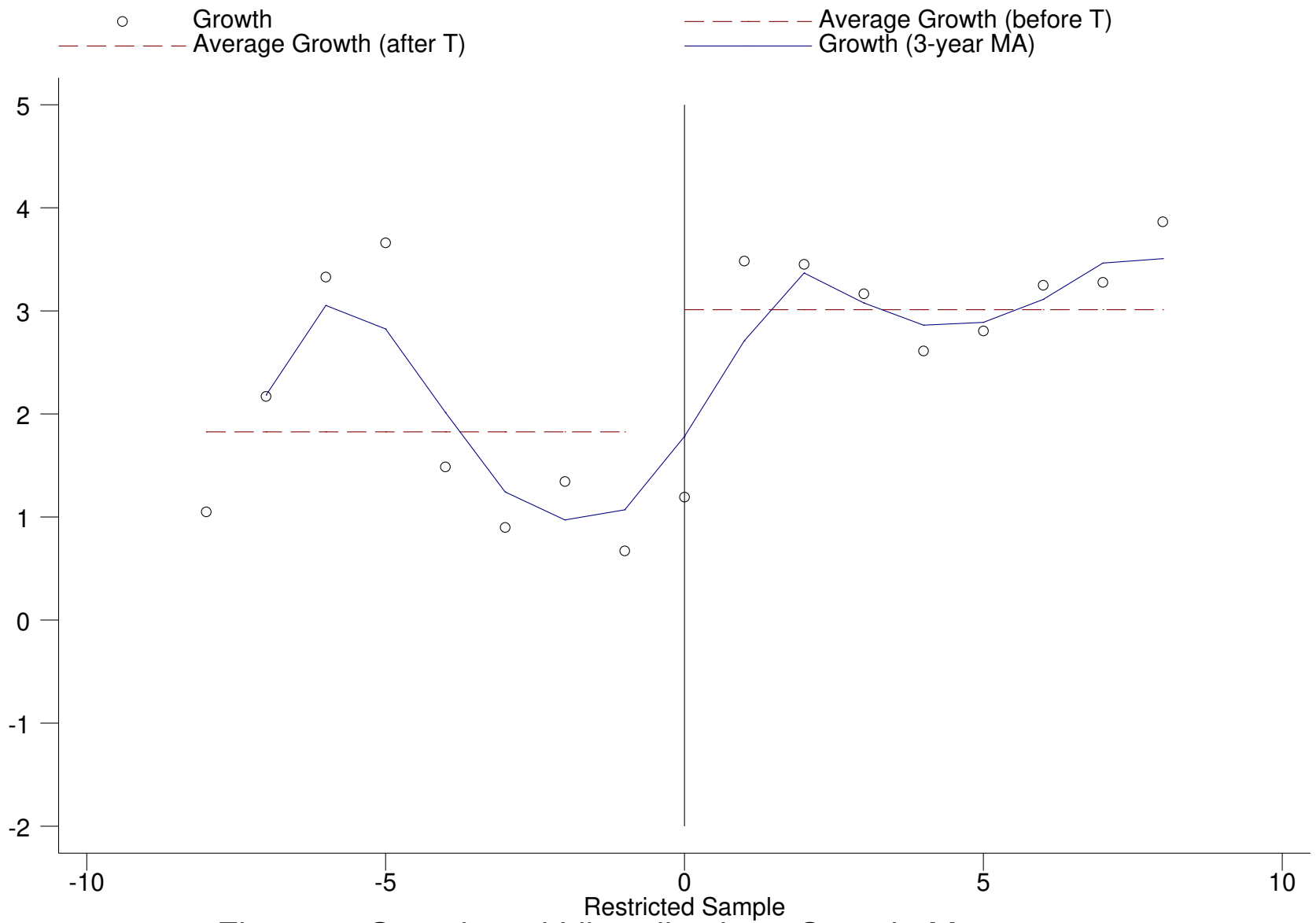


Figure 5. Growth and Liberalization - Sample Means

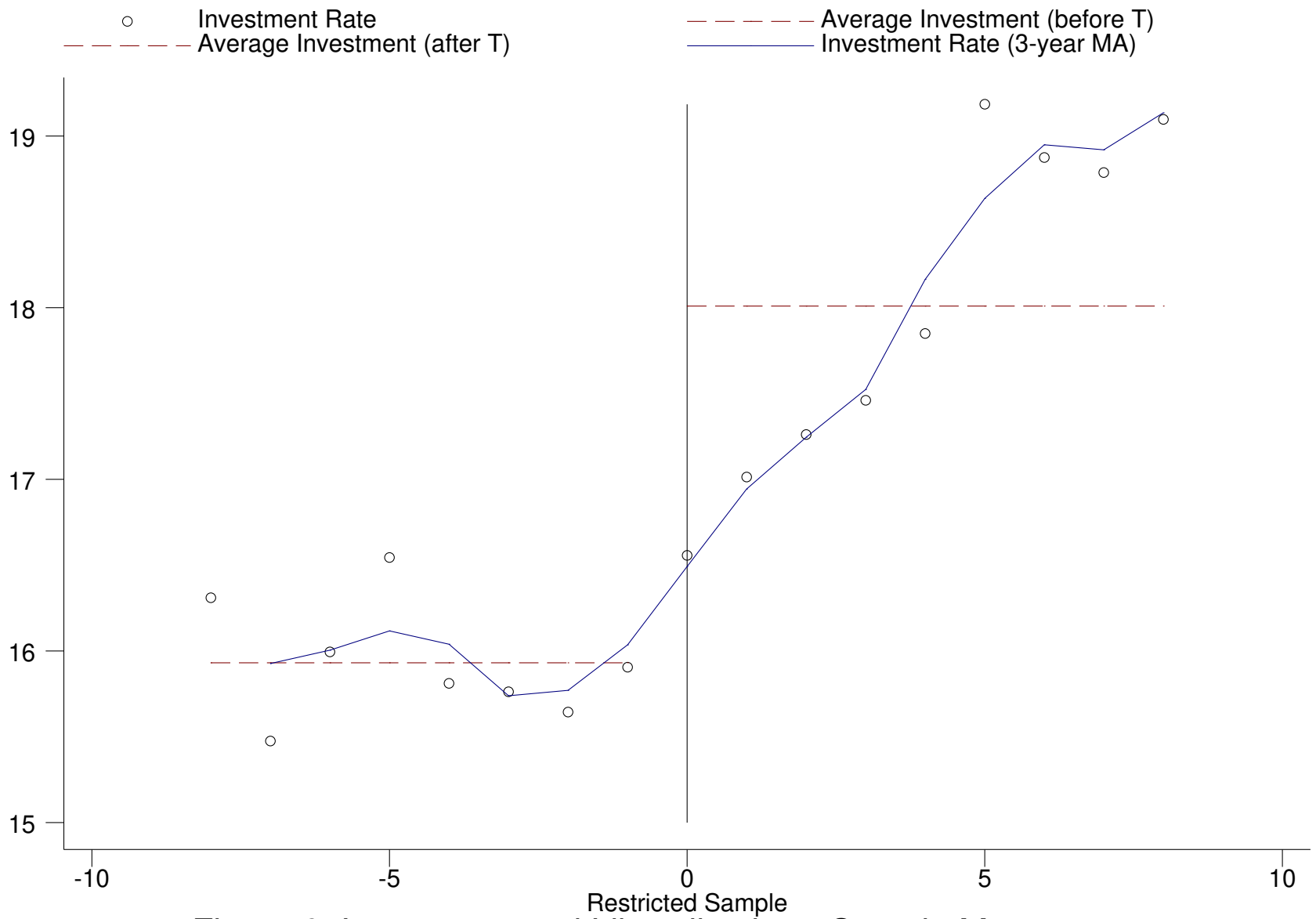


Figure 6. Investment and Liberalization - Sample Means

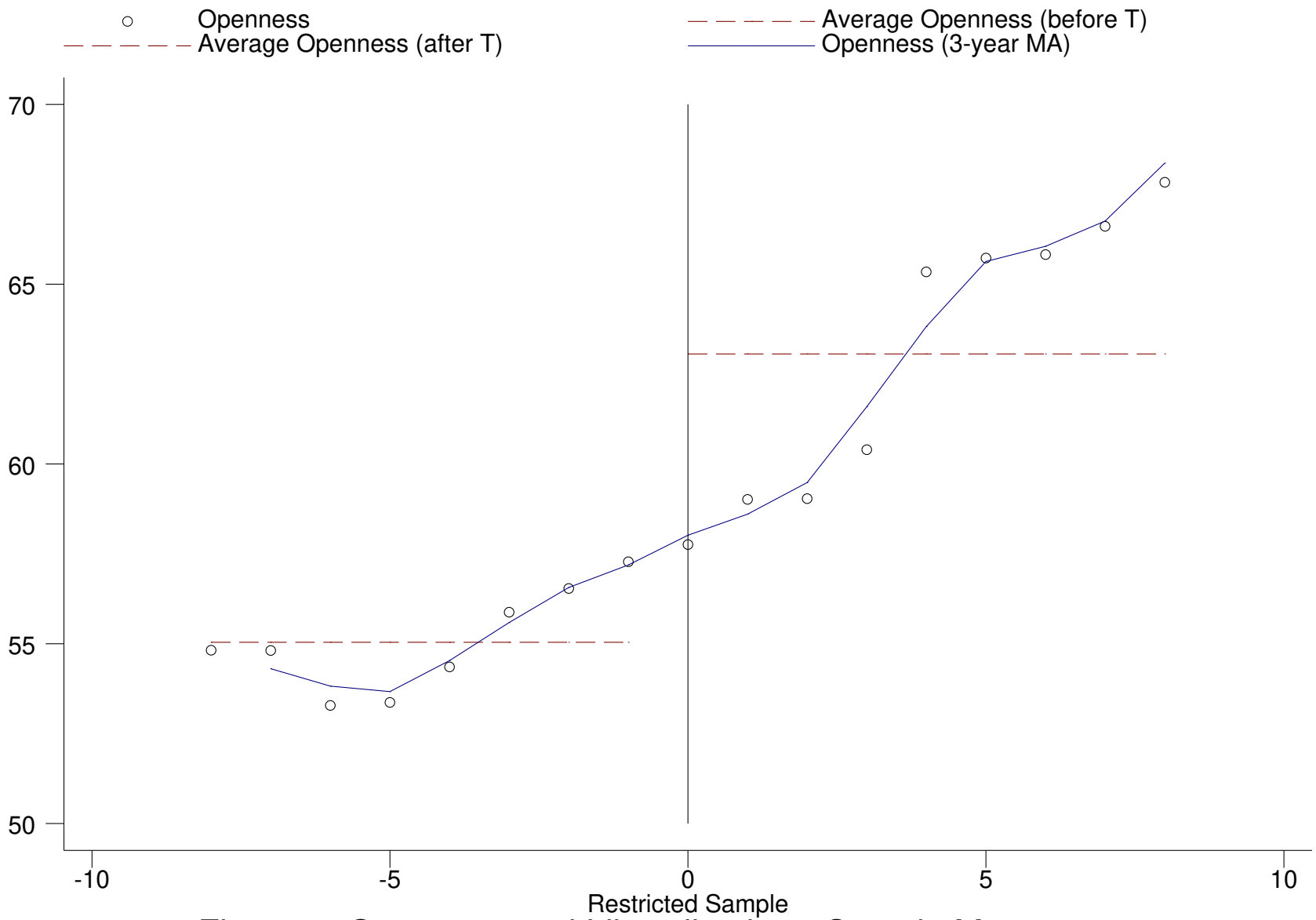
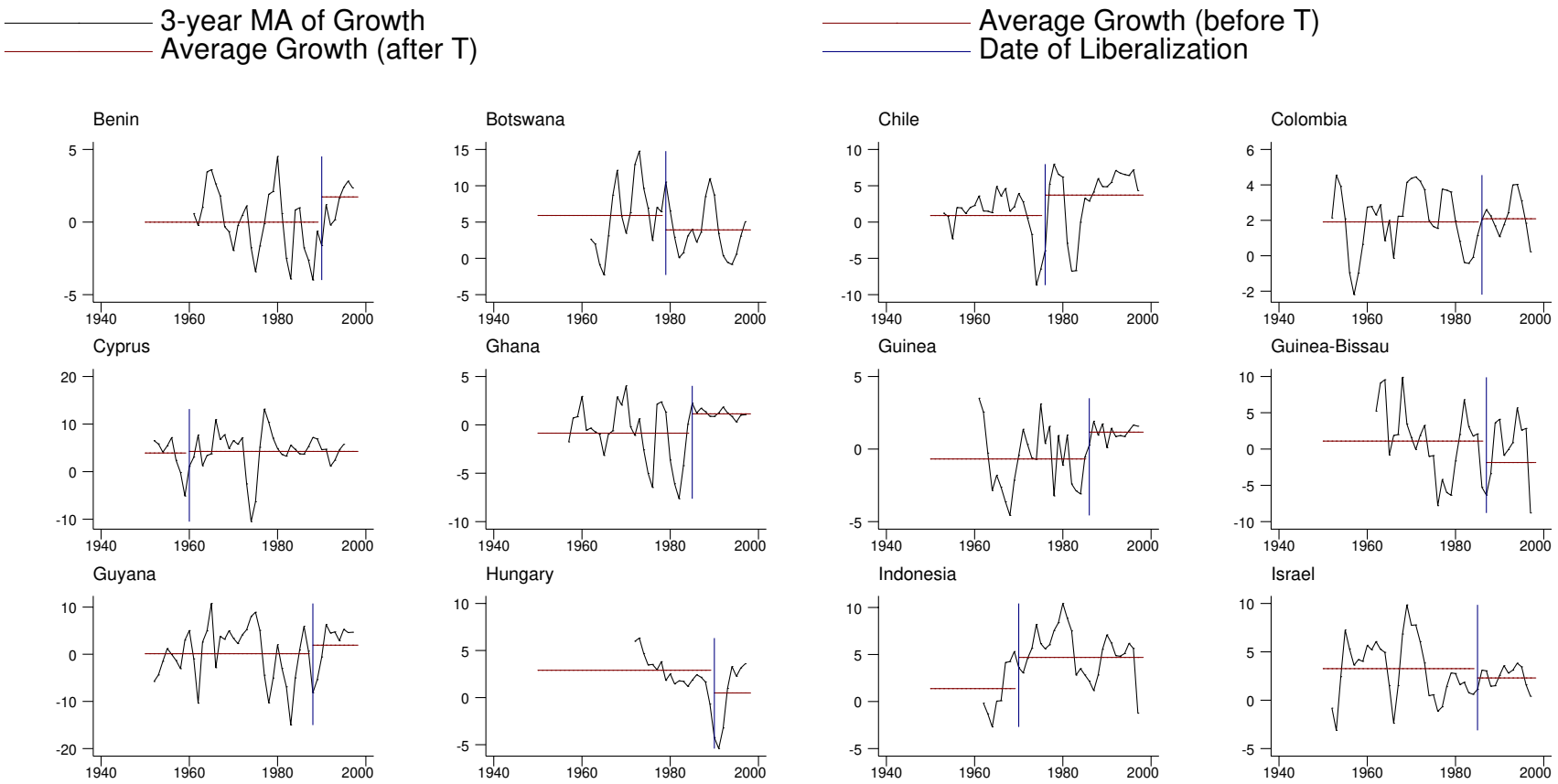
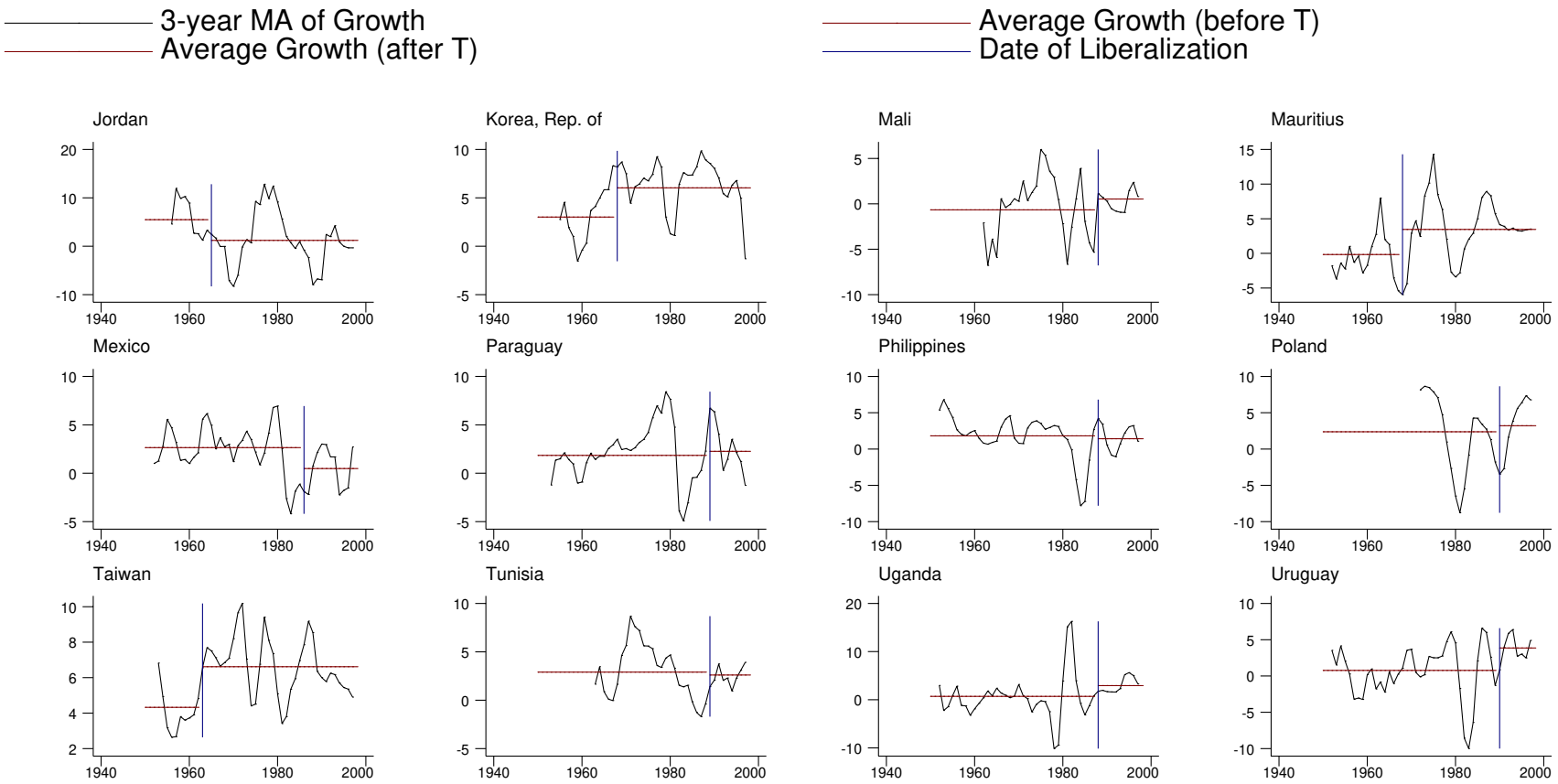


Figure 7. Openness and Liberalization - Sample Means



Year, 1950-2000

Figure 8. Growth and Liberalization - Selected Countries (1)



Year, 1950-2000

Figure 9. Growth and Liberalization - Selected Countries (2)

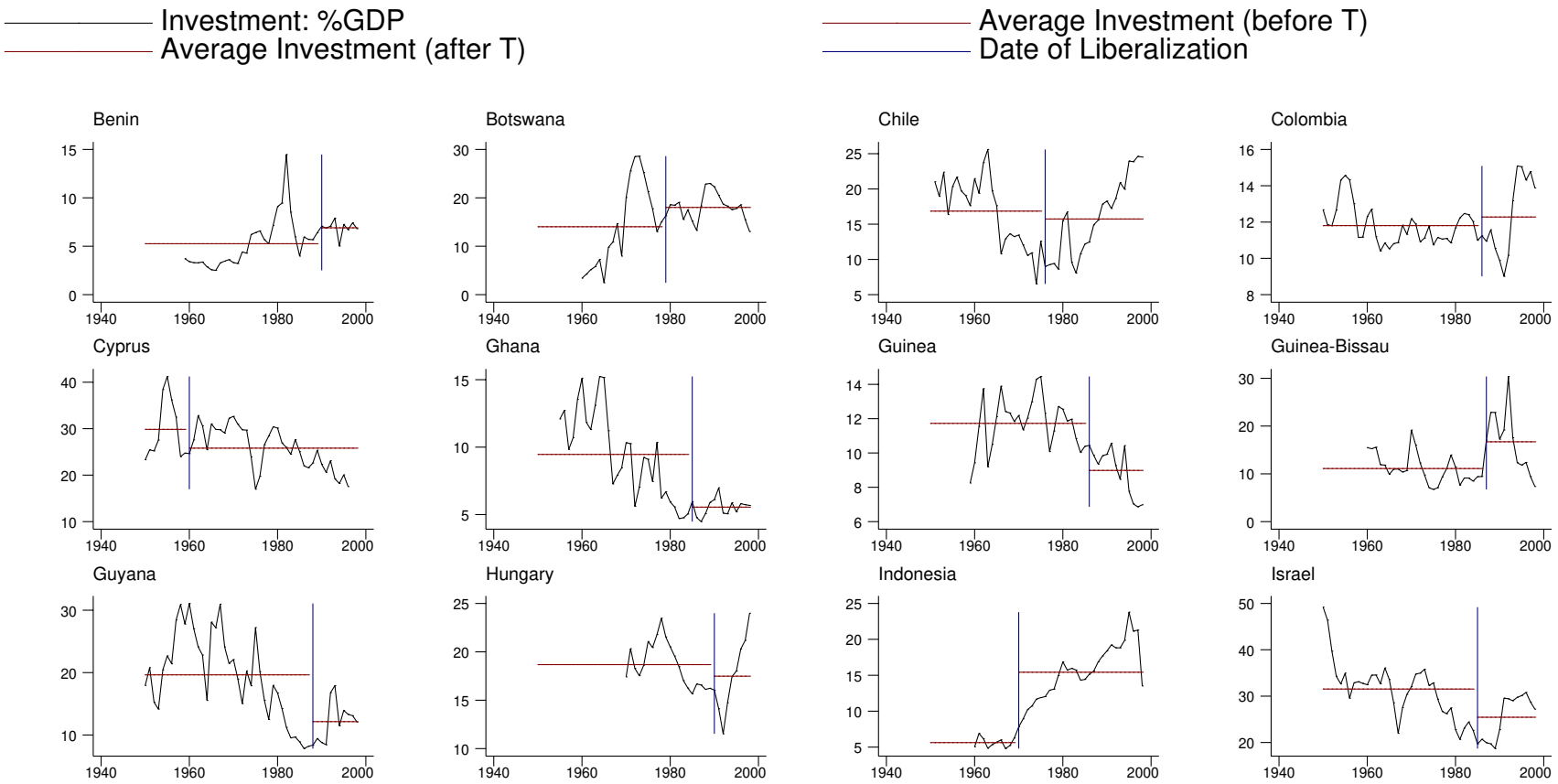
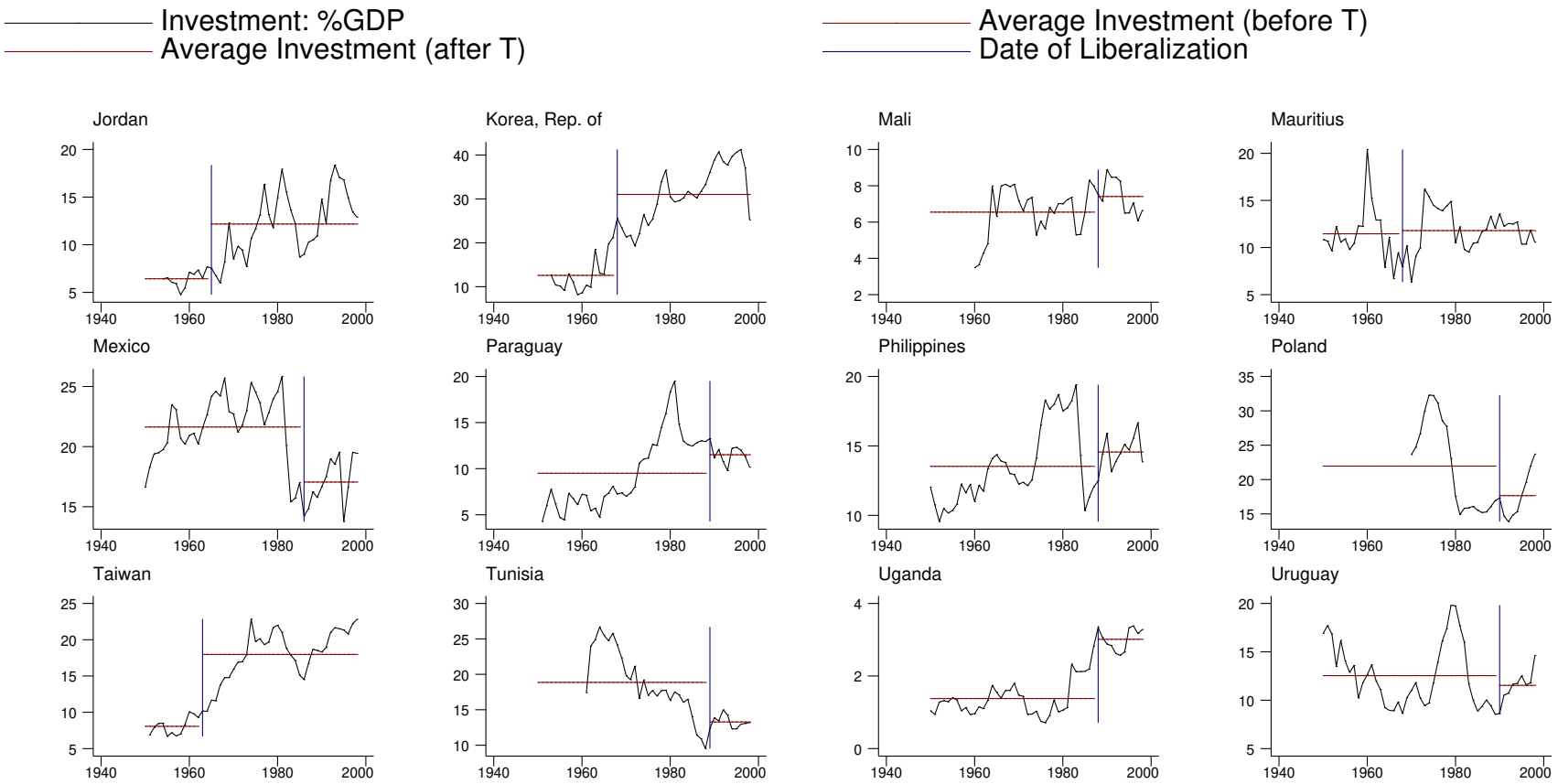


Figure 10. Investment and Liberalization - Selected Countries (1)



Year, 1950-2000

Figure 11. Investment and Liberalization - Selected Countries (2)

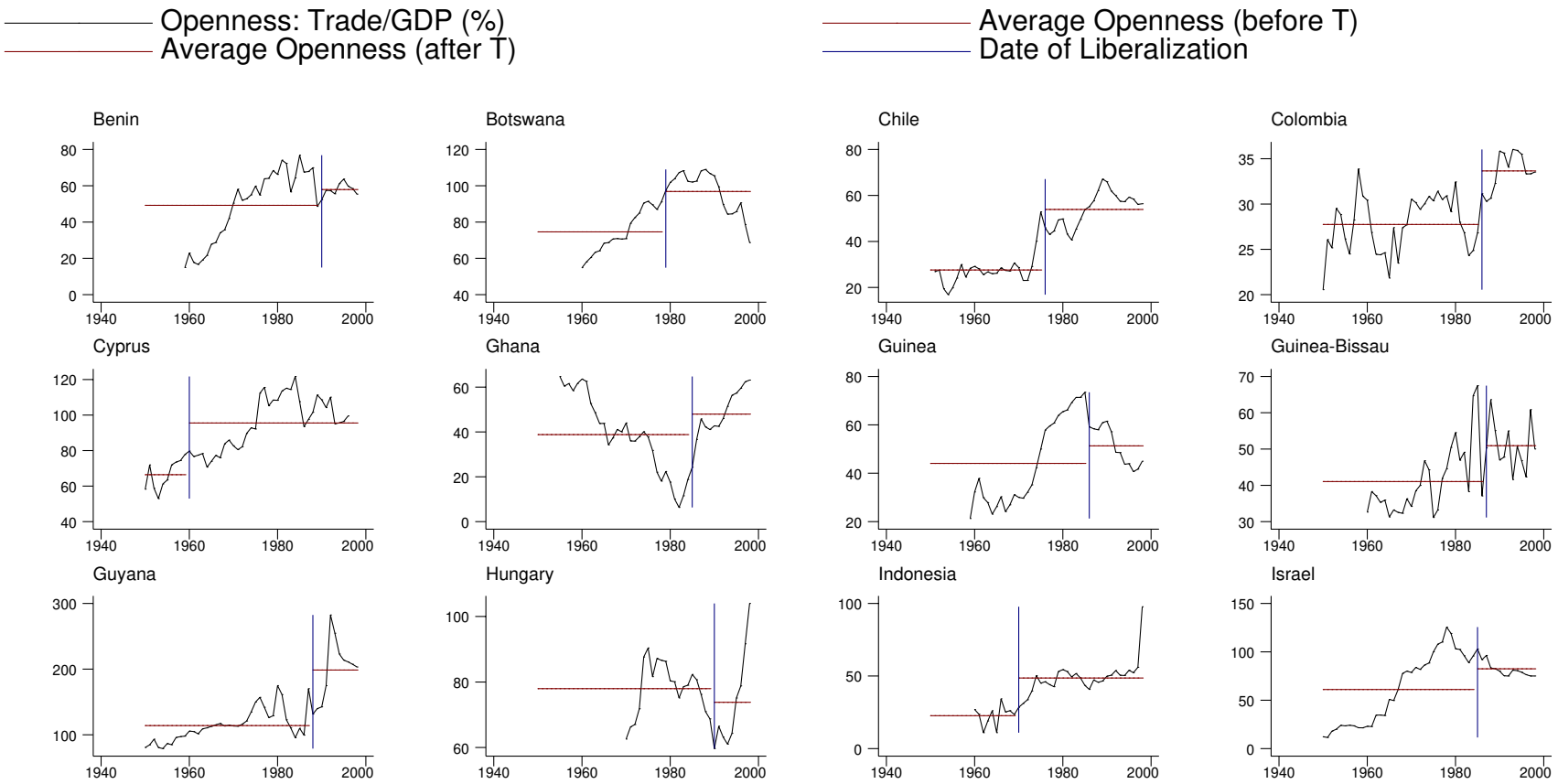


Figure 12. Openness and Liberalization - Selected Countries (1)

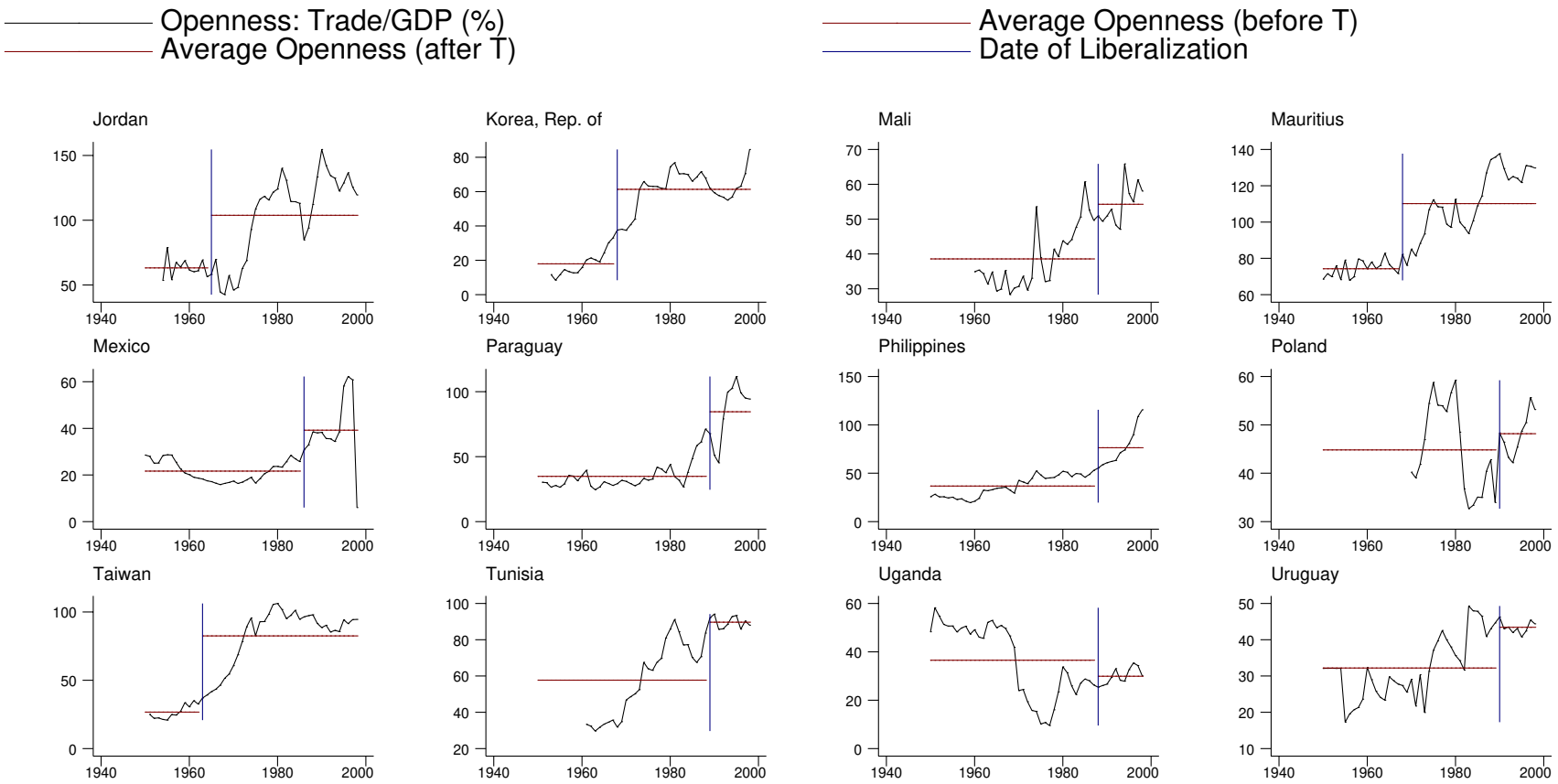


Figure 13. Openness and Liberalization - Selected Countries (2)