

Democracy and the GATT/WTO Accession Duration*

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Abstract

Recent studies have suggested that accession to GATT/WTO is a complex, difficult, and lengthy process, and such process has lengthened in recent years. Using survival analysis, we find that the applicant's political regime, together with several other variables, has a significant impact on the time it takes to accede to GATT/WTO. In particular, the accession duration is likely shorter for an applicant whose political regime is more democratic, whose economy is larger, whose economy grows faster, who initiated its accession before 1995, who adopts a fixed exchange rate regime, who is not a least developed country, and increases with the size of GATT/WTO.

JEL: F13, F14

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1 Introduction

Accession to the World Trade Organization (WTO) is recognized as a complex, difficult, and lengthy process (Michalopoulos, 2000, p.61). The fifteen years of long and hard negotiation experience of China¹, often described as a “long march”², serve as a good example to reveal how accession to GATT/WTO can be a consuming process – in terms of time and real resources, to the applicants and to members in the working party established to examine the accession request.

The *potential* gains from membership to the applicant and the existing member must be tremendous. Otherwise, the applicants and their corresponding working party members would not want to spend so much time and resources in the accession process. Recent theoretical papers by Bagwell and Staiger (1999, 2002) show the importance of the WTO framework of multilateral trade negotiations in realization the gains from trade.

The related empirical works are far behind than those fo theoretical ones. Most prvious empirical studies on accession tend to be descriptive, concentrating a specific or small set of recently acceded countries. For examples, Trumm (2005) studied the accession experiences of Cambodia, Mongolia, Ethiopia and Azerbaijan; Evenett (2004) of Bulgaria and Ecuador; Fotsbetg (1998) of Japan; and Alexandroff *et al.* (2002) of China. Some other trade empirical literature, instead, focuses on whether or not the accession to the GATT/WTO

¹Nationalist China was one of the 23 founding members of the WTO’s predecessor, the General Agreement on Tariffs and Trade (GATT) in 1948. In 1950, one year after the 1949 Communist takeover, China pulled out of GATT, denouncing it as a capitalist club. China started its application to resume its membership in 1986 and was acceded to WTO only in 2001.

²The term “Long March” is often used to describe the massive military retreat undertaken by the Chinese Communist Army to evade the pursuit of the Kuomintang army from 1934 to 1935.

promotes trade. Rose (2004) and Subramanian and Wei (2003) argue whether or not the membership to GATT/WTO can promote trade volume. Studies like Li and Wu (2004), instead, explore the effect of the GATT/WTO membership on economic growth.

However, very few studies provide a complete investigation on the time taken for an applicant to become a GATT/WTO member, which we refer to "accession duration" henceforth. The exceptions are Michalopoulos (2000) and Evenett and Primo Braga (2005). They considered the accession duration of recently acceded countries and found that the recently acceded countries took longer to complete the accession than those acceded earlier. However, none of these studies looked into the accession duration for countries acceded before the formation of WTO. Nor did they control for the characteristics of the applicants in their analyses.

We believe that a thorough study of the determinants of the accession duration has important policy implications, as well as contribution to various literature. In this paper, we will systematically document the accession durations from 1948 to 2005. We explore, and test statistically, how the accession duration is related to the country-specific characteristics of the applicants (such as the political regime of the applicants and the size of applicant's economy), and factors that are specific to GATT/WTO (such as the expansion of GATT and WTO membership, and the establishment of WTO).

We are particularly interested in knowing, to what extents, the political regime of an applicant country affects its accession duration for two reasons. First, recent accession experience, such as that of China, has revealed that, in addition to economic rationales driving the accession debate, the difference in political regimes can play a very important

role in the process. Studeis like Reich (1998, p.762) also emphasized that existing members would be easier to accept an applicant with similar democratic regimes: “political concerns have played a significant role in the cases of China and Taiwan. ... The issue of human rights and democratization has also played a role in China-Taiwan’s accession debate. Some members of Congress argue that the United States should reward Taiwan’s recent democratization by supporting its immediate accession to the WTO.” Second, recent literature in political science has found strong association of democratization of a country and its participation in international organizations. Examples include Mansfield and Pevehouse (2006), Pevehouse (2005), Mansfield *et al.* (2002) and Cooper (2003). Mansfield *et al.* (2002) found that two countries are more likely to enter a preferential trading agreement when the two countries are more democratic. Cooper (2003) examined the validity of the notion that World Trade Organization promotes democracy. She found little evidence that WTO membership in itself promotes democratic transition, but supporting evidence that democratic countries are more likely to seek to join the WTO. By exploring the relationship between accession duration and the political regime of the applicant, our study thus contributes to the understanding of whether political regime of a country will be a barrier or a promoter in its membership application to an international organization, GATT/WTO in this case.

We appear to be the first to conduct such a comprehensive study on the accession duration. Indeed, most empirical studies on accession focus on the accession experience after the formation of WTO. One possible reason is that documentation before the formation of WTO was less readily available. Most of the documents were in microfiche format,

publicly available only in several GATT depository libraries. These documents during the GATT years were digitized only recently by the Stanford GATT Digital Library. The digitization of the documents allows us to conduct a comprehensive study on the accession experience before 1995.

Our paper makes several major contributions. First, by conducting such a comprehensive study on accession duration, we contribute to the literature of political economy of trade. The GATT/WTO accession duration is of particular interest since the negotiation mechanism involved in the accession process is unique to GATT/WTO, which is much different from those in other international organizations, such as International Monetary Fund and the World Bank Group. More importantly, to our best limited knowledge, we are the first to consider how a country's institutional quality in terms of democracy level could affect its accession duration. Therefore we join a small group of consider the role of political economy on the WTO accession.

Second, we contribute to the empirical literature of bargaining. Probably the most important and consuming step in the GATT/WTO accession process is the negotiation with the members of working party on the applicant's commitment in providing other members access to its market. Essentially, it is a process to determine how the gains from trade should be split among the participants/members, as in many other negotiation and bargaining processes. Although empirical studies on bargaining durations are abundant, most of them are on the bargaining over labor contracts in the United States (e.g., Kennan and Wilson, 1993, and Manzini, 1998) and none of them are on the bargaining involving international organizations. Thus, our study contributes to the bargaining literature by

providing an additional piece of evidence on the bargaining to accede to an international organization, namely GATT/WTO.

Third, we contribute empirical evidence to the literature of the relationship between democratization and international organization participation. Bargaining among countries can be more complicated than bargaining between a firm and a labor union because the former involves politics among countries. As mentioned earlier, previous studies have found a strong association between the participation in international organization and democratization. However, none of these previous studies focussed on the relation between democratization and the time taken to accede to WTO. As discussed in a later section, how the political regime (democracy versus dictatorship) affects the accession duration remains an interesting empirical question.

Our results can also have important policy implications. Since our result allows us to predict the accession duration of current applicants, such as Russia and Vietnam, as well as those who have yet applied to accede to WTO, policy makers in the applicant countries can make use of such prediction to assess the expected accession duration and the real resources required to complete the negotiation. To the WTO, our test of whether least developed countries (LDCs) take longer to complete the accession negotiation will be an important piece of evidence in future consideration whether additional assistance should be provided to speed up the accession process of the LDCs.

The rest of the paper is organized as follows. In section 2, we provide an overview of the procedure to accede to GATT/WTO and the candidate determinants of accession duration. In section 3, we describe the data and methodology. In section 4, we report the

empirical results. In section 5, we conclude.

2 Accession to The GATT /WTO

In this section, we describe the procedure to the GATT/WTO accession, followed by the discussion of the candidate determinants of the accession duration.

2.1 Procedure to Accede to the GATT/WTO

Shortly after the World War II, over 50 countries participated in negotiations to create an International Trade Organization (ITO). The hope was to give an early boost to trade liberalization, and to begin to correct the legacy of protectionist measures which remained in place from the early 1930s. In December 1945, 15 countries had begun talks to reduce and bind customs tariffs. On October 30, 1947, 23 countries signed the General Agreement on Tariffs and Trade (GATT). The tariff concessions came into effect by 30 June 1948 through a “Protocol of Provisional Application”. However, the intended ITO was not formed and the signatory is on an agreement only. The 23 founding members are therefore officially called “contracting parties”: Australia, Belgium, Brazil, Burma, Canada, Ceylon, Chile, China, Cuba, Czechoslovakia, France, India, Lebanon, Luxembourg, Netherlands, New Zealand, Norway, Pakistan, Southern Rhodesia, Syria, South Africa, United Kingdom and the United States.³ Although these 23 countries are often called founding members, some countries due to governmental procedure were not able to sign the Protocol of Provisional Agreement in 1948. Thus, on record, some “founding

³See http://www.wto.org/English/thewto_e/whatis_e/tif_e/fact4_e.htm for a more detailed description of the history of GATT formation.

members” were acceded to GATT in a later date.⁴

In January 1, 1995, following the Marrakesh Declaration after the Uruguay Round, the World Trade Organization (WTO) was established. WTO differs from GATT in: (1) it is a permanent institution, commitments are full and permanent and bind by international law; (2) in addition to goods (i.e., GATT), it covers also trade in services (i.e., General Agreement on Trade in Services, or in short, GATS) and trade-related aspects of intellectual property rights (i.e., Agreement on Trade-Related Aspects of Intellectual Property Rights, or in short, TRIPS Agreement); (3) it provides a dispute settlement system to help resolve trade conflicts among members.

The WTO membership is open to any state or customs territory that has full autonomy in the conduct of its trade policies, subject to terms agreed between the applicant and WTO members (Article XII of the WTO Agreement). During the last half a century, the number of the members of the GATT/WTO increases dramatically. As shown in Figure 1, the GATT membership expanded over time to 126 countries (custom regions) by the end of 1994. From 1995 to 2005, the WTO membership further expanded to 149 countries.

[Insert Figure 1 here]

Based on the GATT documents available,⁵ it appears that the accession procedure was

⁴See Crowley (2003) for a brief introduction to GATT/WTO.

⁵Two documents from GATT Basic Instruments & Selected Documents (BISD) have the details about the accession procedure: BISDI/104-119 (“Tariff Negotiations Procedures – Procedures adopted for Torquay Tariff Conference”) and BISD II/148-157 (“Tariff Negotiations and Accession”). In addition, in the GATT document C/49, 16 December 1964, the GATT Executive Secretary noted the procedures for accession: Article XXXIII provides that a government may accede to the General Agreement “on terms to be agreed between such governments and the CONTRACTING PARTIES”. When an application for accession is received the CONTRACTING PARTIES or the Council arrange for relevant aspects of the commercial policy of the application country to be examined in a working party which may recommend that

more or less the same as that of WTO. GATT 1947 accession procedures have been largely carried over to the WTO with the deliberations on trade schedules extended to include services and intellectual property rights. Figure 2 summarizes the steps needed to accede to GATT/WTO. The accession process is initiated by a letter from the applicant expressing its desire to accede to the organization. Subsequently, a working party is established. Membership of the working party is open to all GATT/WTO members. Usually, only those who have enough resources to engage in negotiations and have substantial interest in the applicant's accession will participate. For example, the Working Party for China's accession consists of sixty-three member countries.⁶

[Insert Figure 2 here]

In early years of GATT, applicants have to negotiate with all members. That is, the working party consisted of all GATT members. For example, in the case of Japan which applied for accession in July 1952, no working party was established. Instead, "the

provisional accession be granted as an interim arrangement pending full accession under Article XXXIII, or that tariff negotiations with a view to full accession take place forthwith between the applicant government and those contracting parties wishing to participate in such negotiations, or a combination of these two procedures. If full accession is envisaged, a protocol containing the terms of accession is prepared by the trade negotiations body, but before this is opened for acceptance a decision approving the terms is submitted to a vote by the contracting parties. In accordance with Article XXXIII this decision must be adopted by a two-thirds majority. Provided the decision has been adopted the accession becomes effective following acceptance of the protocol by the acceding government. The document suggests that the accession procedure in the GATT years was similar to that of WTO.

⁶The sixty-three Working Party members were: Argentina; Hong Kong, China; Nicaragua; Australia; Hungary; Norway; Bangladesh; Iceland; Pakistan; Bolivia; India; Panama; Brazil; Indonesia; Peru; Bulgaria; Israel; Philippines; Canada; Jamaica; Poland; Chile; Japan; Romania; Colombia; Korea; Singapore; Costa Rica; Kuwait; Slovak Republic; Croatia; Kyrgyz Republic; Slovenia; Cuba; Latvia; South Africa; Czech Republic; Lithuania; Sri Lanka; Dominican Republic; Macau, China; Switzerland; Ecuador; Malaysia; Thailand; Egypt; Mauritius; Tunisia; El Salvador; Mexico; Turkey; European Communities and member States; Mongolia; United States; Morocco; Uruguay; Guatemala; Myanmar; Venezuela; Honduras; New Zealand; Zimbabwe; Paraguay. The chairperson of the working party was H.E. Mr. Pierre-Louis Girard of Switzerland. Refer to WTO documents WT/ACC/CHN/2/Rev.11, 7 June 2001 and WT/ACC/CHN/2/Rev.11/Corr.11, 22 June 2001 for other details.

Executive Secretary informed the contracting parties telegraphically on 19 July 1952 of the application of the Government of Japan, and requested them to advise by 19 August 1952, whether they had any objections to Japan entering into negotiations and, should, negotiations take place, whether they would wish to participate.” (GATT document L/29, 30 September 1952)

Upon the successful formation of the working party, the applicant is then requested by the working party to submit a memorandum covering all aspects of its trade and legal regime.⁷ The working party will examine all aspects of existing trade and legal regimes of the applicant and seek further clarifications of the memorandum from the applicant.

After the examination of memorandum, the working party will start the multilateral negotiations which will determine the terms and conditions of entry for the applicant. Meanwhile, the applicant government will engage in bilateral negotiations with working party members on concessions and commitments on market access for goods and services. These bilateral and multilateral negotiations can take many rounds to conclude. When completed, the results of these negotiations (both bilateral and multilateral) are consolidated and added into a document, which will become part of an “accession package”. The accession package evolves as more negotiations are concluded.

When all negotiations are concluded and all working party members are satisfied, a final “accession package” is prepared and adopted at a final meeting of the working party. The package consists of a report of the working party containing a summary of proceedings and conditions of entry, a Protocol of Accession, and schedules of market access commitments

⁷The WTO document WT/ACC/1 outlines the major headings to be examined.

in goods and services agreed between the applicant and WTO Members.

The documents are then passed to the General Council or Ministerial Conference for adoption. Only two-third of votes from the members are required for approval.

Once approved by the General Council or Ministerial Conference, the applicant is then free to sign the Protocol of Accession stating that it accepts the approved “accessions package” subject to ratification in its national parliament. Normally three months is given from signature of the Protocol of Accession for this to take place. Thirty days after the applicant government notifies the WTO Secretariat that it has completed its ratification procedures, the applicant government becomes a full Member of the WTO.

Not all countries/custom regions have to go through this accession procedure. Some countries got acceded to GATT without negotiation because they were parts of a GATT/WTO member country and have been applying GATT rules on a *de facto* basis. Article XXVI:5(c) of the General Agreement states “*If any of the customs territories, in respect of which a contracting party has accepted this Agreement, possesses or acquires full autonomy in the conduct of its external commercial relations and of the other matters provided for in this Agreement, such territory shall, upon sponsorship through a declaration by the responsible contracting party establishing the above-mentioned fact, be deemed to be a contracting party.*”

For example, Hong Kong was acceded to GATT in 1986 without any negotiation. “Hong Kong has become, with effect from 23 April, a contracting party to the General Agreement on Tariffs and Trade. Hong Kong is deemed to be a contracting party to GATT by virtue of a declaration made by the United Kingdom Government under Article

XXVI:5(c) of the General Agreement which was delivered to the GATT Secretariat on 23 April 1986. The GATT Secretariat also received on 23 April 1986 a parallel declaration from the Government of the People’s Republic of China confirming that, as from 1 July 1997, the Hong Kong Special Administrative Region will continue to meet the requirements necessary to be deemed a contracting party, to GATT as prescribed in Article XXVI:5(c) of the General Agreement.”⁸

Consequently, we categorize the GATT/WTO members into two groups: (1) members who had to go through the accession negotiation, as listed in Table 1; and (2) members who skipped the accession procedure due to their colonial background, as listed in Table 2. We observe from Table 1 that the time taken to complete the accession varies much, with an average of 7 years and a standard deviation of 5.5 years. Our data reveals that Democratic Republic of the Congo took the longest time to complete its accession – 26 years.

[Insert Table 1 and Table 2 here]

However, the process of the WTO is still an on-going work. Till today there are still 31 countries in process to accede to the WTO. Table 3 lists such applicants as of December 2005. Within the whole process of GATT/WTO accession, one of the substantial parts is multilateral and bilateral negotiations. Indeed, Michalopoulos (1998, p.9) explains how complication the negotiations could be:

“Within the rules and disciplines of the WTO, each country has consider-

⁸See GATT document GATT/1384, 24 April 1986.

able scope as to how restrictive or liberal its trade regime will be. There are no specific rules as to the maximum level at which a country has to bind its tariffs, or how many services it will liberalize; or whether to establish anti-dumping legislation or not; or how fast it will liberalize its agricultural trade. Countries thus have a strategic choice to make during the negotiations phase: How liberal their trade regime will be, consistent with the overall WTO disciplines. The key decisions countries have to make relate to the level at which countries bind their tariffs, the support they provide to agriculture and the range of commitments in the liberalization of the service trade.”

Consequently, in their accession negotiations, some countries have tried to liberalize as little as minimally necessary to ensure accession. Doing so will keep future liberalization of the applicant’s market access a bargaining chip in future rounds of negotiation. Playing this kind of strategy will likely lengthen the negotiation process and hence the accession duration.

As pointed out in Bagwell and Staiger (2005), because any commitments made during the negotiation process will apply to all other members of WTO, due to the Most-Favored-Nation (i.e., non-discrimination) principles, the accession process will induce strategies which will be “foot-dragging” and hence may take longer to complete as the GATT/WTO membership enlarges.

Focusing on the accession experience of countries after the formation of WTO, both of Michalopoulos (2000) and Evenett and Primo Braga (2005) concluded that the GATT/WTO

accession duration has lengthened in recent years. Their conclusion is based on a plot similar to Figure 3, but focused on the years after 1995 when WTO was formed. However, these studies did not offer reasons that the accession duration has lengthened. Nor did they control for any variables that may explain the variation in accession duration.

[Insert Figure 3 here]

2.2 Determinants of the Accession

A host of candidate variables can potentially influence the accession duration. Perhaps the political regime of the applicant is one of the most important determinants. As shown in the recent accession experience of China, the difference in political regimes between the applicants and the members of the working party can play a very important role in the accession process. See, for example, Reich (1998) for a discussion of the impact of political regimes on China's accession process. Various studies, such as Mansfield and Pevehouse (2006) and Pevehouse (2005), have shown a more democratic country is more likely to participate in international organizations. Mansfield *et al.* (2002) studied the relationship between democratization and the participation in preferential trading agreements. Cooper (2003) studied the effect of GATT/WTO membership on democratization. All of these studies implicitly suggest that a democratic country is likely to face less barrier in acceding to GATT/WTO, hence a shorter accession duration. It is also possible, however, that a country with a more democratic regime is more likely to have a more powerful legislative system, demanding more time to discuss a proposal. Consequently it would take more time to reach an agreement compared to those with less democratic regimes.

Changes in the GATT/WTO may also influence the accession duration. While it is impossible to capture all the changes in the GATT/WTO, we consider: (1) the size of the GATT/WTO at the time of application; (2) whether the application was filed before 1995; and (3) whether the accession is completed after 1995. As we had outlined earlier, after receiving the application, a working party will be formed to negotiate with the applicant on various terms of accession, and all GATT/WTO members are eligible to join the working party. Although participation is on a voluntary basis, the potential size the working party increases with the size of GATT/WTO. Assuming that time to complete a negotiation with an additional working party member remains constant, the accession duration will increase with the number of members in the work party, proxied by the size of the GATT/WTO.

In addition, as suggested by Bagwell and Staiger (2005) and Michalopoulos (1998), the strategic behavior of the applicants can lengthen the accession duration as the size of GATT/WTO grows. Whether the application was initiated after 1995 and whether the accession is completed after 1995 are used to proxy any other change in the complexity in the accession process. Accession to the WTO under *Article XII* is a much more complicated undertaking than accession to the GATT 1947, largely due to the increased scope and coverage of the WTO agreements. Hence, we expect any application started after 1995 or span across 1995 will take longer to complete. It is also possible that the technology progress has facilitated communications among applicants and members, and consequently shortens the time to reach a decision in recent years.

Country-specific characteristics can play a very important role. First and foremost,

a country's democracy level could play a significant role on its GATT/WTO accession duration. It is possible that an applicant which is more open to trade is more likely to experience a longer accession duration because it will have to negotiate with the members on many more items. However, it is also possible that when an applicant is more open, it shares more common interests and better understanding with other existing members of the WTO, and hence the negotiation process could be shorter. Second, size of the applicant's economy could play a significant role on WTO duration. Many evidence on the trade gravity equation have already suggested that larger countries tend to have a larger trade volume (Feenstra, 2003, p. 145-46). Thus an applicant's size may have an indirect effect on accession duration through the trade volume. However, it is unclear that such an effect is positive or negative. On one hand, the higher the trade volume the more complex the negotiation, and the more time spent on the accession. On the other hand, the larger the economy of the applicant, the more benefits the applicant will likely bring to existing members. As a result, those existing members would more welcome applicants with larger market sizes.

In the same vein, the expected growth rate of an economy should have similar impact on the accession duration. Last but not least, the international exchange rate regime can also play an important role in the GATT/WTO accession. By reducing the uncertainty in international trade, a fixed exchange rate regime can promote bilateral trade, *ceteris paribus* (Klein and Shambaugh, 2004). In this sense, we hypothesize that the fixed exchange rate regime lengthens the accession duration.

3 Data and Measurement

The dates of accession (to GATT and WTO) are taken from the official WTO website. For those who were acceded to WTO (after 1995), we obtain the date of application from the WTO website.⁹ For members who were initially acceded to GATT (before 1995), we collect the information about date of application from the Stanford GATT Digital Library. The date of accession application is taken as the date when the applicant communicated with GATT its accession intention. The accession duration is defined as the number of months between the date of application and the date of accession (see Table 1 for details). The accession data collected reveals that there are substantial numbers of GATT contracting parties or WTO members who did not go through the normal accession procedure. They were certified by Director-General as members under the provisions of Article XXVI:5(c) because they were under the rule of a GATT/WTO members and has been applying the General Agreement on a *de facto* basis. Because our focus is in explaining the accession duration, these countries are excluded from our analysis.

We use the institutionalized democracy index from *Polity IV* data set as a measure of the degree of democracy of the applicants. As Feng (2003) summarized, there are four different measures of a country's democracy: (1) the institutionalized democracy index from the *Polity IV* data set constructed by Gurr *et al.* (1990) and developed by Marshall and Jaggers (2004); (2) the dichotomous index proposed by Przeworski, *et al.* (1996) who labels a regime as democratic if governments are selected in contested elections; (3)

⁹See http://www.wto.org/english/thewto_e/acc_e/completeacc_e.htm

the liberal democracy index initiated by Bollen (1998) which is defined as a function of political liberties and democratic rule, ranging from 0 to 100 with a higher index indicating a higher level of political liberalization; (4) the Freedom House indicator, maintained by the Freedom House researchers, which assigns countries on two separate seven-point scales to measure their political rights and civil liberties, with *one* representing the highest degree of freedom and *seven* the lowest.

The institutionalized democracy index from the *Polity IV* data set appears the most widely accepted measurement of democracy (Eichengreen and Leblang, 2006, Yu, 2005). The index includes annual composite indicators measuring both “institutionalized democracy” and “institutionalized autocracy” for just about every independent regime with a population over 500,000. The political liberalization index is thus defined as the difference between the democracy indicator and the authoritarian indicator. Each indicator is an additive eleven-point scale (0-10) based on scale weights on the four factors: (1) competitiveness of political participation; (2) competitive of executive recruitment; (3) openness of executive recruitment; and (4) constraints on chief executive. Accordingly, the political liberalization index is scaled between -10 and 10, with -10 representing the least level of political liberalization.

The *Polity IV* data set has two distinct advantages over the other measures, for our purpose. First, compared to the dichotomous index, the institutionalized democracy index is a continuous variable and hence could avoid possible arbitrary cut-off line for democracy. Second, compared to the liberal democracy index and the Freedom House indicator, the institutionalized democracy index has a longer coverage. The former two indices do not

cover pre-1972 and post-1988 periods in which some of our observations fall and thus are not suitable for our purpose.

Other variables are standard in the literature of international trade. A country's economy scale using the PPP adjusted GDP and GDP growth rate. Trade openness is measured by the sum of export and import relative to its GDP. We also construct an exchange rate regime dummy: coded 1 for countries with floating exchange rate regimes and 0 otherwise (i.e., fixed). Generally speaking, there are 8 types of different regimes for exchange rate as follows: (1) exchange arrangements with no separate legal tender (e.g., El Salvador); (2) currency board arrangements (e.g., Estonia); (3) other conventional fixed peg arrangements (e.g., Saudi Arabia); (4) pegged exchange rate within horizontal bands (e.g., Hungary); (5) crawling pegs (e.g., Costa Rica); (6) exchange rates within crawling bands (e.g., Romania); (7) managed floating with no predetermined path for the exchange rate (e.g., Croatia); and (8) independent floating (e.g., Columbia). We label all types except the last one as fixed exchange rate regime because governments are likely to control the exchange rate movement more in the former seven types.

Table 4 reports the summary statistics of the variables used in our study. For readers' convenience, we also include a summary description of the variables in the Appendix.

[Insert Table 4 here]

4 Empirical results

We adopt the survival analysis in modelling the accession duration. Specifically, let T be the random variable of accession duration, which has a continuous probability density of

$f(t)$. The corresponding cumulative distribution is given by

$$F(t) = \int_0^t f(s)ds = \Pr(T \leq t). \quad (1)$$

The survival function $S(t)$, the probability that the accession duration is of length at least t (or equivalently, the probability that the accession negotiation survives at least up to time t), is defined as

$$S(t) = 1 - F(t) = \Pr(T \geq t), \quad (2)$$

The conditional probability (known as the ‘‘hazard’’) that an applicant country will complete the accession negotiation in a particular time, given that accession has not occurred previously is:

$$h(t) = \lim_{\Delta t \rightarrow 0} \frac{\Pr(t < T < t + \Delta t | T \leq t)}{\Delta t}, \quad (3)$$

Note that when this hazard function is constant over time, the reciprocal of the hazard, $1/h(t)$, may be interpreted as expected accession duration. For instance, an constant hazard of 0.125 will mean an expected accession duration of 8 years.¹⁰

We consider various specifications of the hazard $h(t)$. We start with a non-parametric Kaplan-Meier estimate of the survival function to get a sense of its median survival times. We focus our discussion in the Cox proportional hazard model estimation. As a robustness check, we will consider Weibull proportional hazard model, the piece-wise exponential constant hazard model, and logistic discrete model.¹¹

¹⁰For a discussion, for instance, see Allison (1995, pp.17-18).

¹¹Readers who are not familiar with such econometric models can refer to Wooldridge (2002) and Jenkins (2005).

4.1 Benchmark Non-parametric Specification

The Kaplan-Meier non-parametric estimate of the survival function, $S(t_i)$, is defined as the product of one minus the “entry rate” at each of the survival times:

$$S(t_i) = \prod_{i|t_i < t} \left(1 - \frac{d_i}{n_i}\right),$$

where the “entry rate”, d_i/n_i , is the number of entries divided by the number of countries at risk of entry; t_i , $i = 1, \dots, n$, is the survival times that are observed in our data set.¹²

Figure 3 plots the Kaplan-Meier estimates of survival function. It demonstrates that the median survival time (i.e., accession duration) is 5.76 years. That is, 49% of the sample countries acceded to the GATT/WTO after around 6 years with a 95% confidence interval between 35% and 62%.

[Insert Figure 3 here]

To get a sense of how political regime may impact on the accession duration, we also compute the Kaplan-Meier estimates of survival function by regime type, measured by the dichotomous democracy indicator of Przeworski *et. al.* (1996). A regime is labeled as democratic if governments are selected in contested elections (the variable “regime” coded as 0), and dictatorial otherwise (coded 1). Because the indicator is available for years 1950-1990 only, for those countries acceded after 1990, their values of the indicator

¹²Note that the Nelson-Aalen estimator, an alternative non-parametric survival analysis method, has slight advantage on small-sample data set but bear the shortcoming of the accurate estimates of the survival function. Since we care more on the survival function of the member contry’s GATT/WTO accession, we henceforth use the Kaplan-Meier analysis. In our sample, the difference between the Kaplan-Meier estimate and the Nelson-Aalen estimate is negligible.

is assumed to be the same as those latest available, i.e., the values in 1990. When taken a closer look at those countries acceded after 1990, this approximation using the latest index available appears reasonable.

Figure 4 plots the survival functions by democratic regime. It shows that countries with democratic regime ($regime = 0$) seem to have shorter median survival time (accession duration) of 5.2 years than does the countries with non-democratic regime (6.2 years). There is statistically significant difference in the survival rates after the fifth year. From the third year to the fifth year, the survival rate for these two types of countries almost coincide. In the sixth year, about 30% of democratic countries survive to the next year, while 40% of the non-democratic countries do. In thirteenth year, all democratic applicants would have completed the accession negotiation and become a GATT/WTO member. But, the non-democratic applicants can take up to 26 years to complete the accession negotiation. The standard errors are small for all periods (in the range of 0.01 to 0.08). Thus, the difference in GATT/WTO accession duration across democratic regimes are both statistically and economically significant.

[Insert Figure 4 here]

4.2 Cox Proportional Hazard Estimates

In order to study how various factors might affect duration of the accession, we adopt the proportional hazard model as follows:

$$h(t, \mathbf{X}, \boldsymbol{\beta}) = \exp(\mathbf{X}'\boldsymbol{\beta})h_0(t), \quad (4)$$

where $h_0(t)$ is the baseline hazard function; t is time since the initial application; \mathbf{X} is a vector of explanatory variables and β are the corresponding coefficient vector. We will estimate this proportional hazard model using the approach suggested by Cox (1972) – hence the name Cox proportional hazard model. Using this approach the baseline hazard function $h_0(t)$, which is assumed common for all countries, will be cancelled out in estimation. Hence, the baseline hazard function is treated as a nuisance and needs not be specified.¹³

Columns 1 to 8 of Table 5 reports the results of the Cox proportional hazard estimates, with different explanatory variables. Results are presented in terms of hazard ratios. A more helpful statistic is obtained by subtracting 1.0 from the risk ratio and multiplying by 100. This gives the estimated percentage change in the hazard for each one-unit increase in the covariate. Take column 1 the hazard ratio for the democracy index as an example. The estimated hazard ratio of 1.042 means a one point scale of democracy leads to an increase of 4.2% ($= (1.042 - 1) * 100\%$) hazard rate of successfully exiting the accession negotiation (i.e., acceded to WTO). Thus, a more democratic regime is associated with a short accession duration.

[Insert Table 5 here]

The results in columns 1 to 8 shows that the coefficient estimates of the Cox proportional hazard model are quite stable across specifications. We focus on the full model in

¹³Since the baseline hazard need not be specified, it can take any form: $h_0(t) = \alpha t$, as in the Gompertz model; or $h_0(t) = \alpha \log t$, as in the Weibull model; or as a step function as in the piece-wise hazard model. See, for example, Allison (1995) for a discussion.

column 8 in the following discussion. The estimated hazard ratio of 1.047 for the democracy index means a one point scale of democracy leads to a an increase of 4.7% ($= (1.047 - 1) * 100\%$) hazard rate of successful accession to the GATT/WTO), statistically significant at 10% level. Thus, a more democratic regime is associated with a shorter accession duration.

A country with 1 percent higher GDP (size is measured as log GDP), faces a higher hazard of 14.7%, statistically insignificant at 5% level. Thus, large countries are likely to take less time to accede to GATT/WTO. Traditional wisdom would suggest otherwise: since larger countries trade more, much more terms involving trading goods will be discussed in the international negotiation for larger countries and hence would take longer to conclude the negotiation. A possible explanation to our counter-intuitive result is that because larger countries play a significant role on global trade, existing members would readily welcome a large applicant country in order to access to its large domestic market. Indeed, there are two opposite factors driving the accession duration. First, both the applicant and members may want to speed up the accession process when the gains from trade is potentially large. Second, the applicants may want to offer less and the members may want to extract more in the negotiation (not possible, or worth the time, for a small applicant), and hence it may take longer to negotiate. Our results suggest the first factor is more dominant.

How about the effect of size of GATT/WTO? As discussed earlier, a working party will be established to review the accession application. In principle, any existing GATT/WTO members are eligible to join the party. Put in another way, the potential size of the

working party is limited by the number of existing members. The more members in the GATT/WTO, the more likely to have a larger working party. Our estimate suggests that one more existing members in the GATT/WTO leads to 2.3% higher hazard and therefore shorten the duration of the GATT/WTO accession. This is also a striking finding: one would expect that the more existing members the more time spent on the negotiation. The economic rationale behind this empirical finding deserves more research. Nonetheless, it is possible that this variable captures some other trend variables not included in our list of variables. Another possibility is that the advancement in communication technology might have shorten the time of negotiation.

We find that an applicant with more open trade (measured by its trade volume) is more likely to have a shorter accession duration. The hazard ratio of 0.672 for trade openness means that for each unit increase the measure of openness, the hazard of successfully exiting the accession negotiation (i.e., accessed to WTO) falls by 32.8% ($=100(0.672-1)$). Thus, the impact of benefits to members from an applicant (which tend to shorten the accession duration) appears larger than that of the increased items negotiated (which tends to lengthen the accession duration). It is also possible that with more items under negotiation, it might be easier for the negotiator to juggle the gives and takes, leading to a shorter accession duration.

Can a country's annual growth rate during the accession process affect its duration? A one percent increase in growth rate is associated with 22.3% increase in hazard rate. that is, the duration of accession for a country with higher growth rate is estimated to be shorter than those with lower growth rate. A country with high growth rate implies that its

economy is booming. Its outstanding economic performance makes itself very popular to the existing members of the GATT/WTO. Accordingly, those members have incentive to welcome such an applicant so that they can share the benefits from the booming economy. Put in another way, a country with high growth rate is much easier to get involved into the global economic system, *ceteris paribus*.

Letting a fixed exchange rate regime be the benchmark, a floating exchange rate regime has an around 23.1% lower hazard, though statistically insignificant at conventional levels. That is, compared to those fixed exchange rate regimes, applicants with a floating exchange rate take long time to accede.

A least developed country is found to spend much time on WTO accession. One possibility is because the market size for the least developed countries is limited. Consequently, the existing members neither take much effort nor have strong incentive to pull such least developed countries to accede to GATT/WTO. Indeed, the agenda set out by the Doha Ministerial Conference in November 2001 emphasizes that “Accession of LDCs remains a priority for the Membership. We agree to work to facilitate and accelerate negotiations with acceding LDCs.”¹⁴ Note that LDCs are already disadvantaged in its small economy size. Yet, in the accession process, they may face technical difficulty to negotiate or even to understand the documents. Consequently, it is likely that the accession duration is longer for the LDCs. If our explanation is the truly the cause of longer accession duration

¹⁴See Doha WTO Ministerial 2001: Ministerial Declaration WT/MIN(01)/DEC/1, 20 November 2001. Available at http://www.wto.org/English/thewto_e/minist_e/min01_e/mindecl_e.htm, (accessed April 3, 2007).

for LDCs, additional technical assistance to them could be useful.

Finally, has the accession duration lengthened due to the formation of the WTO in year 1995? Figures 5 and 6 plot the accession duration against the date of application and date of accession respectively. When the accession duration is plotted against the date of application (Figure 5), it appears that the accession duration has lengthened as suggested by Michalopoulos (2000) and Evenett and Primo Braga (2005). However, no similar visible pattern is observed when the accession duration is plotted against the date of application (Figure 6). Thus, simple plots like Figures 5 and 6 do not provide definite answers whether the accession duration has lengthened because other important factors were not controlled for.

[Insert Figure 5 and 6 here]

The hazard ratio estimate of the dummy of application (coded 1 if the accession was initiated after 1995, and 0 otherwise) from the Cox proportional hazard model (again, column 8 of Table 5) suggest that the countries which applied before 1995 have a lower hazard rate by around 68% than those applied after 1995, statistically significant at 5% level. In other words, countries applied before 1995 take much more time to accede to the GATT/WTO. The hazard ratio estimate of the dummy of accession (coded 1 if the accession was concluded after 1995, and 0 otherwise) suggests that the hazard rate for those countries which acceded before 1995 is lower than those for countries which acceded after 1995. That is, countries acceded before 1995 take longer than those acceded after 1995. Nevertheless, the latter estimate is statistically insignificant at conventional levels.

Note that this finding is in stark contrast to those suggested by Michalopoulos (2000) and Evenett and Primo Braga (2005). In other words, their conclusion that accession duration has lengthened over time is overturned once other variables are controlled for.

To summarize, three interesting findings for our estimates as shown in column 8 of Table 5. First, compared with non-democratic regimes, a democratic regime bears high hazard rate and therefore takes less time to accede to the GATT/WTO. Second, the more the existing members, the less time to accede to the GATT/WTO. Furthermore, countries initiated the application before 1995 takes longer to accede to the GATT than those initiated after 1995 to accede to the WTO.

4.3 Robustness Checks

We check the robustness of our findings by estimating several alternative popular modeling strategies in survival analysis. Table 6 reports the estimation results: the Weibull proportional hazard model in Column (2); the piece-wise exponential constant hazard model in Column (3); and logistic discrete model in Column (4). For ease of comparison, we also include in Column (1) the result of the Cox proportional hazard model previously reported in Table 5.

Perhaps the Weibull model is the most popular specification for duration *parametric* continuous time survival analysis. Its hazard function $\alpha t^{\alpha-1} \exp(\mathbf{X}_i' \boldsymbol{\beta})$ suggests that it is the only model that satisfies both the proportional hazard (PH) and accelerated failure time (AFT) assumptions.¹⁵ Clearly, for the PH models, the proportional difference of the hazard rate for two different countries results in hazard is constant. Accordingly, a PH

¹⁵when $\alpha = 1$, the Weibull model is reduced to the Exponential model.

regression coefficient associates proportionate changes in *hazard rate* to a unit change in a given regressor, *ceteris paribus*. In contrast, for the AFT model, a one unit change of the coefficient for a regressors is related to a proportional changes in the *survival time* instead. However, in the Weibull model, these two specifications coincide.

The results obtained from the Weibull proportional hazard model (column 2) are similar to those from the Cox semi-parametric model (column 1), both in magnitude and statistical significance: a one point scale increase of an applicant’s democracy raises the hazard rate by 6.3%, statistically significant at 5% level; one more existing member increases an applicant’s hazard ratio by 2.5%; applicants who applied before 1995 have 63% lower hazard than those applied after 1995; and larger countries takes less time to accede to the GATT/WTO.

In the semi-hazard piece-wise constant exponential model, the baseline hazard function is not assumed to be of any specific form but is constant piece-wise. The flexible baseline hazards are assumed constant within each of the following time interval: 1-6 years, 7-11 years, 12-16 years, 17-21 years and 21-26 years. Dummy variables for each of these intervals were included with other explanatory variables. In other words, the baseline hazard function $h_0(t)$ can be specified as a constant hazard within each of five intervals along our survival time axis. Precisely, the corresponding model is:

$$\log[h_i(t)] = \log(h_{0j}) + X_i'\beta, \forall t \in (1, \tau_j), j \in [1, 5], \quad (5)$$

where τ_j is the j -th specific cut-off year. The estimates of the PCE model in Column (3) have very similar results with those obtained from Cox proportional hazard model (column

1): Democracy of an applicant still shortens the time acceded to the GATT/WTO, though statistically insignificant at 5% level; the higher number of existing GATT/WTO members shortens the accession duration, statistically significant at 5% level.

Finally, we find robustness when we use a very different modeling strategy of discrete logistic, in which the dependent variable is binary, coded 1 if an applicant is granted the accession in period t and 0 otherwise. This model allows the explanatory variables to vary from year to year, between the year of initial application and the year of accession and the number of observations is expanded.

Column (4) presents the odds ratio of the logistic discrete model, which allows time-varying covariates. An odds ratio is the exponentiated value of the coefficient estimate, that is, $OR_j = \exp(\beta_j)$. Again, the findings are broadly consistent with the previous findings. In particular, the odds of the accession to the WTO increase by about 5.3% with each extra point of democracy level. Simultaneously, the odds of the accession also increase by about 2.2% with each extra number of existing WTO members. Therefore, the GATT/WTO accession is shortened by democracy and high GDP levels. In contrast, the estimated coefficient of dummy of application imply that the odds of the accession for those countries applied before 1995 is about 61% higher than those of countries applied after 1995.

In a nutshell, our results are robust across different specifications of the baseline hazard functions.

[Insert Table 6]

5 Concluding Remarks

While accession to GATT/WTO has been a big subject of debate, we are surprised to find that almost no previous study has tried to explain the time taken for an applicant country to accede to GATT/WTO (i.e., “accession duration”). Using survival analysis, our study reveals that accession duration is affected by several variables. First, a more democratic applicant is likely to take less time to complete the accession. So is an applicant of a larger economy, and a more open economy. We also find that in contrast to previous studies, when variables are properly controlled, the accession duration has in fact shortened since the founding of WTO in 1995. Nonetheless, our results confirm that the accession process is indeed complex, affected by a host of variables.

Our findings help understand why it took China fifteen years – a very long duration – to accede to the WTO. Our results suggest that some common arguments failed the tests. It is not because China is a large economy and hence the international negotiation is more complicated. Neither is it because the larger number of GATT/WTO members caused a longer negotiation. The most likely reason appears to be that China was less democratic and this political regime difference has caused the negotiation more difficult. This finding is consistent with those discussed in Reich (1998) and Pevehouse (2005): It is possible that democratic countries, which tend to participate more in international organizations, may require the applicant country to democratize before approving an accession.

Our findings have important policy implications. Most discussions of accession issues have not considered the cost in terms of the potentially lengthy negotiation process. The

cost of ignoring the accession duration could be high. Our estimated model may be used to predict the accession duration – and hence real resources committed to complete the accession – for different applicants. At the very least, the prediction can give the potential applicants a reference in their cost and benefit analysis of accession.

It is better to view this paper as part of a long research agenda. To our limited knowledge, no study has conducted theoretical analysis of the impact of potential variables on accession duration. With the results in this paper, we believe that this direction will be fruitful.

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Table 1: Accession duration

Country	Application date	Accession date	Duration (months)	Duration (years)
Bangladesh	10-Oct-1972	16-Dec-1972	9.20	0.767
Korea, Republic of	20-Sep-1966	14-Apr-1967	10.80	0.900
Poland	22-Dec-1966	18-Oct-1967	10.87	0.906
Venezuela	5-Jun-1989	31-Aug-1990	16.87	1.406
Morocco	8-Mar-1985	17-Jun-1987	21.30	1.775
Portugal	19-May-1960	6-May-1962	22.57	1.881
Slovenia	9-Jun-1992	30-Oct-1994	23.70	1.975
Kyrgyz Republic	13-Feb-1996	20-Dec-1998	32.23	2.686
Israel	26-Mar-1959	5-Jul-1962	35.30	2.942
Bolivia	24-Sep-1987	8-Sep-1990	35.47	2.956
Japan	18-Jul-1952	10-Sep-1955	35.73	2.978
Romania	22-Jul-1968	14-Nov-1971	36.73	3.061
Ecuador	18-Sep-1992	21-Jan-1996	42.10	3.508
Spain	21-May-1960	29-Aug-1963	43.27	3.606
Georgia	1-Jun-1996	14-Jun-2000	43.43	3.619
Hungary	9-Jul-1969	9-Sep-1973	50.00	4.167
Guatemala	14-May-1987	10-Oct-1991	51.87	4.322
El Salvador	24-Apr-1987	22-May-1991	51.93	4.328
Thailand	26-Jun-1978	20-Nov-1982	52.80	4.400
Oman	1-Apr-1996	9-Nov-2000	53.27	4.439
Estonia	8-Mar-1994	13-Nov-1999	61.17	5.097
Iceland	11-Dec-1963	21-Apr-1968	61.33	5.111
Mongolia	17-Jun-1991	29-Jan-1997	62.40	5.200
Costa Rica	5-Jul-1985	24-Nov-1990	62.63	5.219
Latvia	8-Nov-1993	10-Feb-1999	69.07	5.756
Panama	16-Aug-1991	6-Sep-1997	69.67	5.806
Jordan	6-Jan-1994	11-Apr-2000	72.17	6.014
Philippines	14-Feb-1973	27-Dec-1979	73.43	6.119
Ireland	1-Nov-1961	22-Dec-1967	75.70	6.308
Croatia	22-Sep-1993	30-Nov-2000	83.27	6.939
Lithuania	1-Jan-1994	31-May-2001	84.00	7.000
Argentina	21-Sep-1960	11-Oct-1967	84.67	7.056
Mexico	19-Jan-1979	24-Aug-1986	86.17	7.181
Honduras	30-Apr-1987	10-Apr-1994	86.33	7.194
Yugoslavia	10-Oct-1958	25-Aug-1966	92.50	7.708
Moldova	25-Nov-1993	26-Jul-2001	95.03	7.919
Albania	12-Nov-1992	8-Sep-2000	97.87	8.156
Chinese Taipei	29-Sep-1992	1-Jan-2002	108.07	9.006
Former Yugoslav Republic of Macedonia	30-Nov-1994	4-Apr-2003	109.13	9.094

Table 1: Accession duration (Continued)

Country	Application date	Accession date	Duration (months)	Duration (years)
Armenia	29-Nov-1993	5-Feb-2003	111.20	9.267
Cambodia	1-Oct-1994	13-Oct-2004	125.40	10.450
Switzerland	15-Sep-1956	1-Aug-1966	126.53	10.544
Bulgaria	8-Sep-1986	1-Dec-1996	126.77	10.564
Saudi Arabia	13-Jun-1993	11-Dec-2005	152.93	12.744
Colombia	17-Dec-1968	3-Oct-1981	153.53	12.794
Nepal	16-May-1989	23-Apr-2004	175.23	14.603
China	10-Jul-1986	11-Dec-2001	181.03	15.086
Paraguay	11-Nov-1974	6-Jan-1994	231.83	19.319
Tunisia	2-Dec-1965	29-Aug-1990	306.90	25.575
Democratic Republic of the Congo	21-Jan-1970	1-Jan-1997	317.33	26.444

Table 2: Countries without formal negotiations

Country	Colony of	Accession date
Papua New Guinea	Australia	16 December, 1994
Burundi	Belgium	13 March, 1965
Rwanda	Belgium	1 January, 1966
Benin (fommerly known as Dahomey)	France	12 September, 1963
Burkina Faso (formerly known as Upper Volta)	France	3 May, 1963
Cameroon	France	3 May, 1963
Central African Republic	France	3 May, 1963
Chad	France	12 July, 1963
Congo (Brazzaville)	France	3 May, 1963
Cote d'Ivoire (fomerly known as Ivory Coast)	France	31 December, 1963
Djibouti	France	16 December, 1994
Gabon	France	3 May, 1963
Guinea	France	8 December, 1994
Madagascar	France	30 September, 1963
Mali	France	11 January, 1993
Mauritania	France	30 September, 1963
Niger	France	31 December, 1963
Senegal	France	27 September, 1963
Togo	France	20 March, 1964
Singapore	Malaysia	20 August, 1973
Surinam	Netherlands	22 March, 1978
Angola	Portugal	8 April, 1994
Guinea Bissau	Portugal	17 March, 1994
Macao	Portugal	11 January, 1991
Mozambique	Portugal	27 July, 1992
Namibia	South Africa	15 September, 1992
Liechtenstein	Switzerland	29 March, 1994
Antigua and Barbuda	UK	30 March, 1987
Bahrain	UK	13 December, 1993
Barbados	UK	15 February, 1967
Belize	UK	7 October, 1983
Botswana	UK	28 August, 1987
Brunei Darussalam	UK	9 December, 1993
Cyprus	UK	15 July, 1963
Dominica	UK	20 April, 1993
Fiji	UK	16 November, 1993
Ghana	UK	17 October, 1957
Grenada	UK	9 February, 1994
Guyana	UK	5 July, 1966
Hong Kong	UK	23 April, 1986

Table 2: Countries without formal negotiations (continued)

Country	Colony of	Accession date
Jamaica	UK	31 December, 1963
Kenya	UK	5 February, 1964
Kuwait	UK	3 May, 1963
Lesotho	UK	8 January, 1988
Malawi	UK	28 August, 1964
Malaysia	UK	24 October, 1957
Maldives	UK	19 April, 1983
Malta	UK	17 November, 1964
Mauritius	UK	2 September, 1970
Nigeria	UK	18 November, 1960
Qatar	UK	7 April, 1994
Saint Kitts and Nevis	UK	24 March, 1994
Saint Lucia	UK	13 April, 1993
Saint Vincent & the Grenadines	UK	18 May, 1993
Sierra Leone	UK	19 May, 1961
Solomon Islands	UK	28 December, 1994
Swaziland	UK	8 February, 1993
Tanzania	UK	9 December, 1961
The Gambia	UK	22 February, 1965
Trinidad and Tobago	UK	23 October, 1962
Uganda	UK	23 October, 1962
United Arab Emirates	UK	8 March, 1994
Zambia	UK	10 February, 1982

Table 3: Accession in progress as of December 2005

Applicant	Application	Working Party		Draft Working Party Report **
		Established	Memorandum	
Afghanistan ⁺	Nov 2004	Dec 2004		
Algeria	Jun 1987	Jun 1987	Jul 1996	Aug 2005
Andorra	Jul 1999	Oct 1997	Mar 1999	
Azerbaijan	Jun 1997	Jul 1997	Apr 1999	
Bahamas	May 2001	Jul 2001		
Belarus	Sep 1993	Oct 1993	Jan 1996	Apr 2005 (FS)
Bhutan ⁺	Sep 1999	Oct 1999	Feb 2003	Aug 2005 (FS)
Bosnia and Herzegovina	May 1999	Jul 1999	Oct 2002	
Cape Verde ⁺	Nov 1999	Jul 2000	Jul 2003	Nov 2005
Ethiopia ⁺	Jan 2003	Feb 2003		
Iran	Jul 1996	May 2005		
Iraq	Sep 2004	Dec 2004	Sep 2005	
Kazakhstan	Jan 1996	Feb 1996	Sep 1996	May 2005
Lao People's Democratic Republic ⁺	Jul 1997	Feb 1998	Mar 2001	
Lebanese Republic	Jan 1999	Apr 1999	Jun 2001	Dec 2005 (FS)
Libyan Arab Jamahiriya	Jun 2004	Jul 2004		
Montenegro	Dec 2004	Feb 2005	Mar 2005	
Russian Federation	Jun 1993	Jun 1993	Mar 1994	Oct 2004
Samoa ⁺	Apr 1998	Jul 1998	Feb 2000	Jun 2003
Sao Tome and Principe ⁺	Jan 2005	May 2005		
Serbia	Dec 2004	Feb 2005	Mar 2005	
Seychelles	May 1995	Jul 1995	Aug 1996	Jun 1997
Sudan ⁺	Oct 1994	Oct 1994	Jan 1999	Sep 2004 (FS)
Tajikistan	May 2001	Jul 2001	Feb 2003	Apr 2005 (FS)
Tonga	Jun 1995	Nov 1995	May 1998	
Ukraine	Nov 1993	Dec 1993	Jul 1994	Aug 2005
Uzbekistan	Dec 1994	Dec 1994	Oct 1998	
Vanuatu ⁺	Jul 1995	Jul 1995	Nov 1995	Accession Package Oct 2001
Viet Nam	Jan 1995	Jan 1995	Sep 1996	Feb 2006
Yemen	Apr 2000	Jul 2000	Nov 2002	

Notes:

1. Data were obtained from http://www.wto.org/english/thewto_e/acc_e/status_e.htm.
2. * indicates "as of the date of this document".
3. ** indicates "most recent Factual Summary (FS), draft Working Party Report or Elements of draft Working Party Report."
4. Least developed countries are marked with "+", based on the UN classification, available at <http://www.un.org/special-rep/ohrlls/ldc/list.htm>

Table 4: Summary Statistics

Variable Name	Mean	Standard Deviation	Minimum	Maximum
Duration				
Days	2528.71	2021	276	9520
Months	84.29	67.38	9.2	317.33
Years	7.02	5.61	0.77	26.44
Log GDP (Initial Year)	23.63	1.61	20.66	28.90
GDP Growth Rate (Initial Year)	0.15	1.01	-0.02	7.08
# of Existing Members	87.22	27.54	32	130
Exchange Rate Dummy	0.47	0.50	0	1
Trade Openness	0.12	0.18	0.01	0.93
Political Democracy	1.88	6.97	-10	10
Dummy of Application	0.51	0.51	0	1
Dummy of Accession	0.31	0.47	0	1
Dummy for Least Developed Countries	0.82	0.28	0	1

Table 5: Estimated Hazard Rate for the Cox Proportional Hazards Model

Regressors	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Political Democracy	1.042*	1.050**	1.062**	1.066**	1.069**	1.052*	1.049*	1.047*
	(1.68)	(2.01)	(2.19)	(2.34)	(2.43)	(1.92)	(1.83)	(1.71)
log GDP		1.180*	1.252*	1.221*	1.206	1.138	1.162	1.147
		(1.78)	(1.95)	(1.71)	(1.60)	(1.09)	(1.22)	(1.08)
# of Existing Members		1.003	1.004	1.003	1.001	1.020**	1.023	1.023**
		(0.45)	(0.67)	(0.44)	(0.17)	(2.04)	(1.14)	(2.08)
Trade Openness			0.437	0.267*	0.242	0.576	0.667	0.672
			(-0.87)	(-1.77)	(-1.25)	(-0.51)	(-0.37)	(-0.36)
GDP Growth Rate				1.346	1.421	1.325	1.219	1.223
				(1.44)	(1.62)	(1.34)	(0.85)	(0.86)
Exchange Rate Dummy					0.768	0.743	0.739	0.761
					(-0.82)	(-0.93)	(-0.94)	(-0.82)
Dummy of Application						0.259**	0.305**	0.315**
						(-2.91)	(-2.44)	(-2.32)
Dummy of Accession							0.651	0.664
							(-0.83)	(-0.79)
Dummy for Least Developed Countries								0.782 (-0.36)
Prob.> Chi-square	.086	.114	.148	.129	.162	.014	.019	.031

Notes:

1. In parentheses are the t-statistics. For survival analysis, t-values are negative when the hazard ratio is less than 1.
2. Coefficients that are significantly different from zero at 10% and 5% are marked with one and two asterisks, respectively.

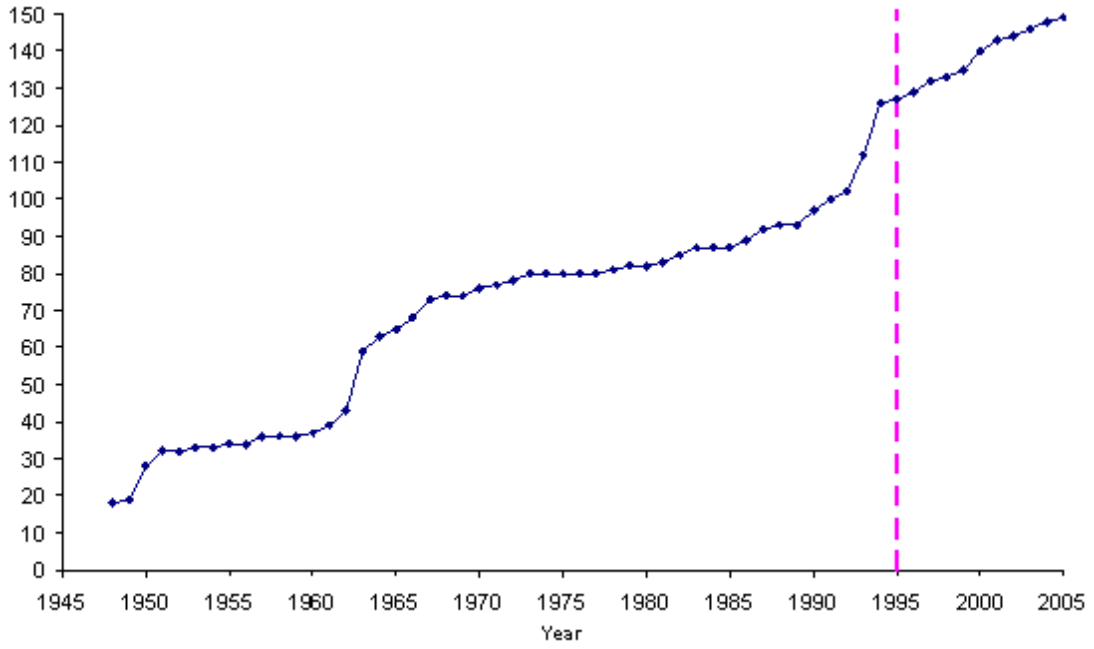
Table 6: Comparison of estimation results from various models

Regressors	(1)	(2)	(3)	(4)
Political Democracy	1.047*	1.063**	1.038	1.053**
	<i>(1.71)</i>	<i>(2.32)</i>	<i>(1.45)</i>	<i>(2.13)</i>
log GDP	1.147	1.238*	1.119	1.172
	<i>(1.08)</i>	<i>(1.74)</i>	<i>(0.90)</i>	<i>(1.23)</i>
# of Existing Members	1.023**	1.025**	1.020*	1.022**
	<i>(2.08)</i>	<i>(2.20)</i>	<i>(1.88)</i>	<i>(2.10)</i>
Trade Openness	0.672	0.520	0.733	1.343
	<i>(-0.36)</i>	<i>(-0.60)</i>	<i>(-0.28)</i>	<i>(0.28)</i>
GDP Growth Rate	1.223	1.135	1.116	0.755
	<i>(0.86)</i>	<i>(0.55)</i>	<i>(0.48)</i>	<i>(-0.75)</i>
Exchange Rate Dummy	0.761	0.820	0.810	1.057
	<i>(-0.82)</i>	<i>(-0.60)</i>	<i>(-0.65)</i>	<i>(0.16)</i>
Dummy of Application	0.315**	0.366**	0.378**	0.393*
	<i>(-2.32)</i>	<i>(-2.09)</i>	<i>(-0.24)</i>	<i>(-1.82)</i>
Dummy of Accession	0.664	0.631	0.630	0.630
	<i>(-0.79)</i>	<i>(-0.91)</i>	<i>(-0.92)</i>	<i>(-0.91)</i>
Dummy for Least Developed Countries	0.782	0.887	0.927	0.969
	<i>(-0.36)</i>	<i>(-0.19)</i>	<i>(-0.13)</i>	<i>(-0.05)</i>
In (time) Base Hazard				1.166
				<i>(0.75)</i>
Prob.> Chi-square	.031	.013	.070	0.144
Number of Observations	48	48	94	344

Notes:

1. Column (1) reports the hazard rate ratios for the Cox proportional hazards model; Column (2) reports the hazard rate ratios for Weibull proportional hazards model; Column (3) reports the hazard rate ratios for piece-wise exponential constant hazards model; and Column (4) reports the odds ratios from Logistic estimates of WTO accession.
2. In parentheses are the t-statistics. For survival analysis, t-values are negative when the hazard ratio is less than 1.
3. Coefficients that are significantly different from zero at 10% and 5% are marked with one and two asterisks, respectively.

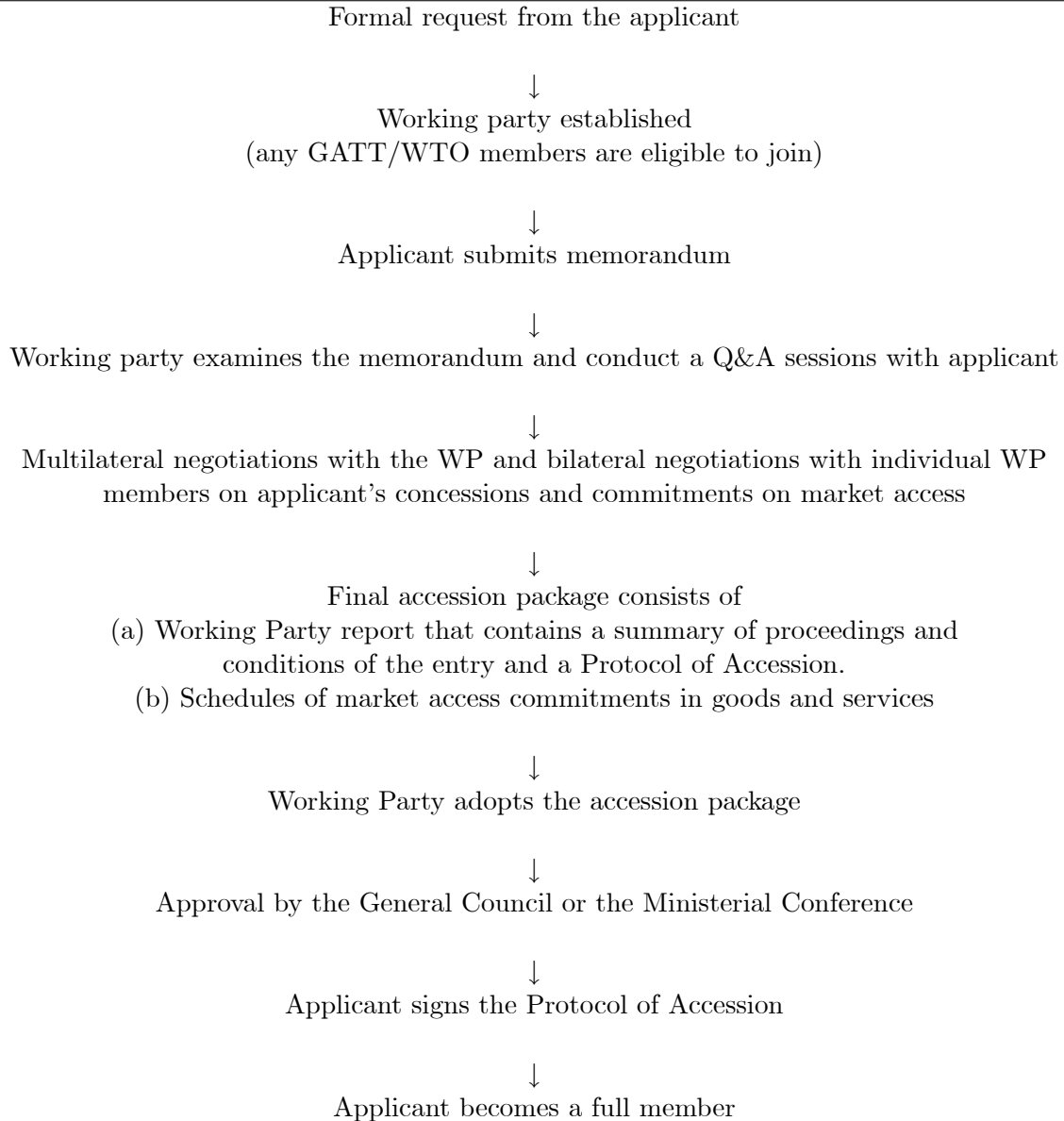
Figure 1: Number of GATT/WTO members



Notes:

1. Vertical line marks the year of 1995 when the WTO was formed.

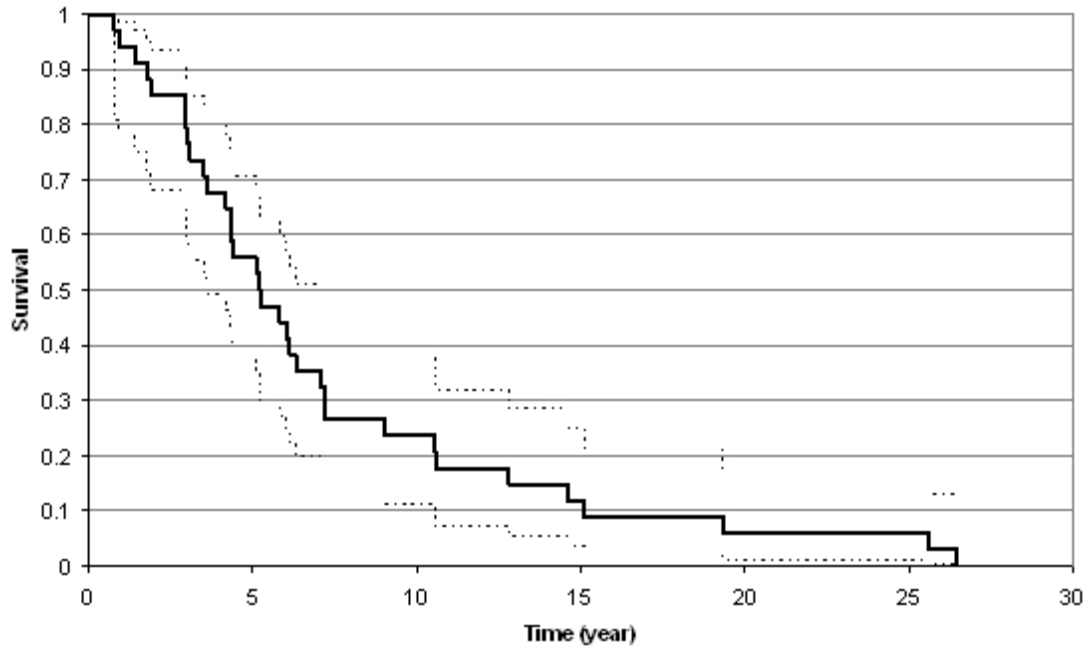
Figure 2: Steps to accede to GATT/WTO



Notes:

1. Authors' summary based on the description available at the WTO website.

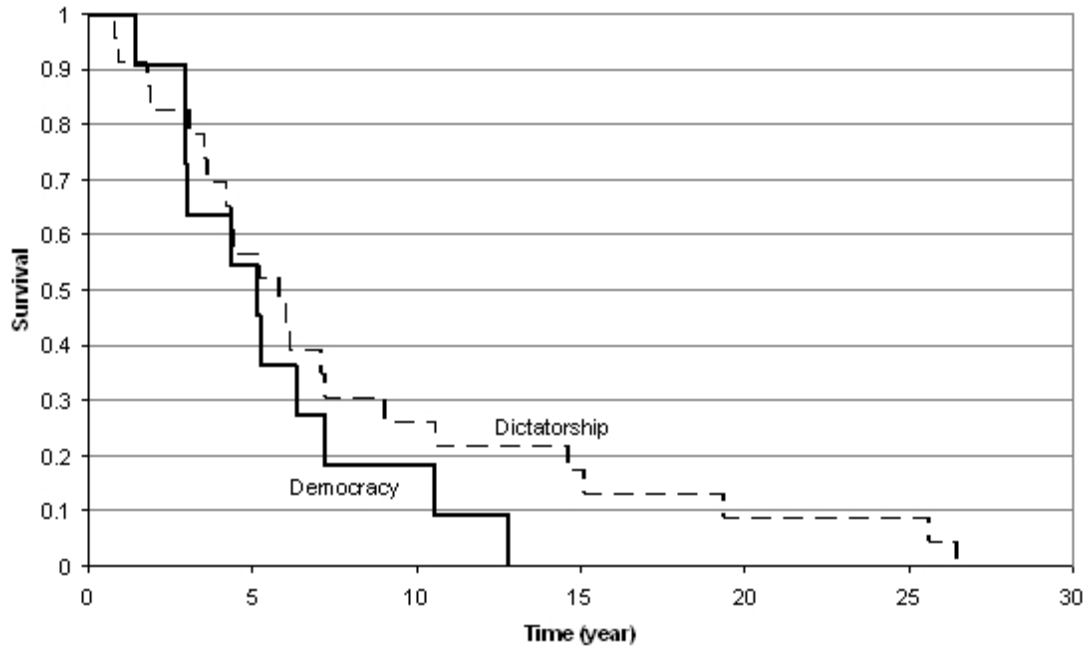
Figure 3: Kaplan-Meier Survival Function for GATT/WTO Accession



Notes:

1. The dotted lines are 95% confidence band.

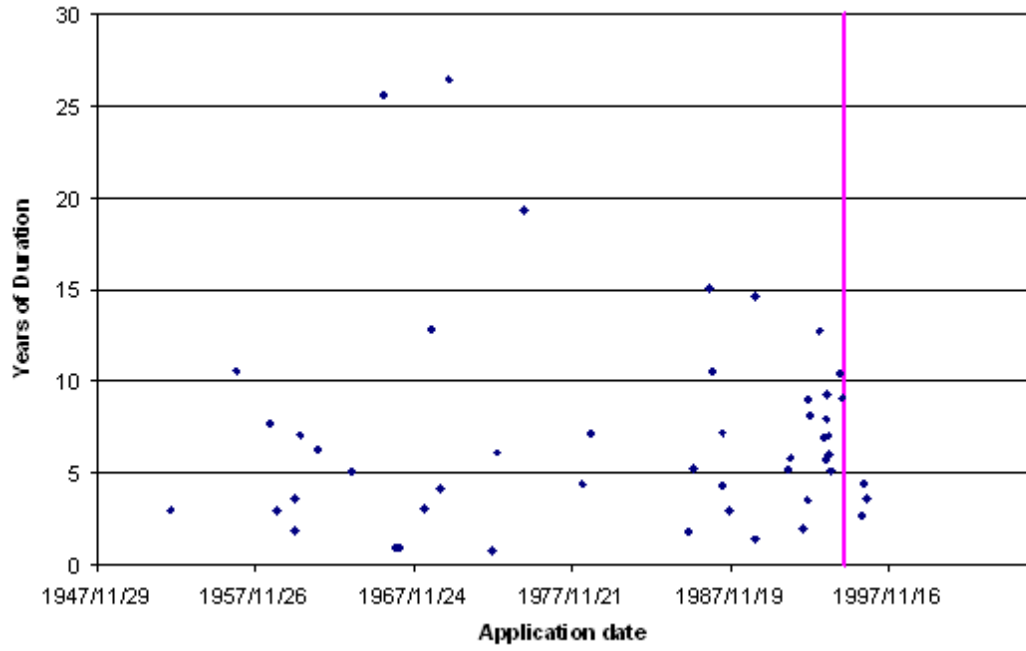
Figure 4: Kaplan-Meier Survival Functions, Stratified by Regime Types



Notes:

1. The regime type (dictatorship and democracy) are based on the the index of Przeworski et.al. (1996), at the date of applicant to accede to GATT/WTO.

Figure 6: Accession duration by date of application



Notes:

1. The vertical time marks 1 January 2005, the date when WTO was established.

Appendix: Description of the variables

Variables	Description
Duration	Time between accession application and completion
Log GDP	Logarithm of real GDP (unit: 1000)
GDP Growth Rate	GDP Growth Rate
# of Existing Member	Number of GATT/WTO members
Exchange Rate Regime	A dummy variable that takes one if the applicant adopted a flexible exchange rate; zero otherwise.
Trade Openness	A ratio of trade volume (import + export) to GDP
Democracy	The Polity index scaled between -10 to 10, that measures the degree of democracy: -10 for an extreme authoritarian), 10 for an extreme democracy.
Application Dummy	An indicator variable that takes 1 if the accession application was submitted after 1995, and 0 otherwise.
Accession Dummy	An indicator variable that takes 1 if the accession was concluded after 1995, and 0 otherwise.
Least Developed Countries Dummy	An indicator variable that take 1 if the applicant is a Least Developed Country, and 0 otherwise.

Notes:

1. The source of the data: Application dummy, accession dummy and LDC dummy were derived from information from the WTO website. Duration is based on our calculation using information collected from the GATT/WTO documents. GDP, GDP growth rate are