Chapter 7

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CHAPTER 7

Understanding the Relationship Between Globalization and Survival of Philippine SMEs

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This paper examines whether firms of heterogeneous size are affected differently by globalization. Are there differences in the survival of SMEs and large enterprises the higher their exposure to imports and lower tariffs? To do this, both tariffs and effective protection rates are used as globalization proxy variables and added to the factors that affect firm shutdowns consisting of firm characteristics such as age, size, productivity, capital intensity, ownership, export, and R&D. Government subsidy and price cost margins at the industry level are also included. To capture firm heterogeneity, firm size was interacted with tariffs and effective protection rates as well as with firm characteristics such as productivity, ownership and export. Using data on the Philippine manufacturing industry from 1996 to 2006, the results confirm previous research finding that firm size, age, and productivity are important determinants of firm exit. Controlling for these attributes, the results show that tariffs are negatively correlated with firm exit and the probability of exit is higher in small firms that face tariff reduction. Firm exit is greater for small enterprises characterized by low productivity, non-exporter and without foreign equity. Firms that have high level of productivity, engaged in export activities and have foreign equity are better able to survive.

***Keywords**:* globalization, survival, SMEs, Philippine manufacturing
***JEL Classification**:* F60, F10, L10

1. Introduction

There is wide recognition that small and medium enterprises (SMEs) play a critical role in the economic growth and industrial development of developing countries worldwide. SMEs are seen as key to boost the economy and strengthen the industrial structure, given their substantial contribution both in terms of number of enterprises and workers. As such, the government has implemented a wide range of policies and programs to promote SME growth and development. Implicit in these policies is the assumption that once SMEs grow and develop, they will continue to contribute to the economy. Firm survival is significant in terms of achieving the long-term growth and employment goals of the country. Giovannetti et al (2011) pointed out that the survival of young firms is fundamental for increased entrepreneurship and a consequent increase in jobs and sustained economic growth. As Ausdretsch (2004) emphasized, SMEs are an important source of innovation, growth and competitiveness.

In the light of rising competition arising from the globalization trend and increasing economic integration; there are concerns that SMEs would be negatively affected by the intense competition arising from trade liberalization. The more recent empirical literature on trade and productivity shows that in the presence of firm heterogeneity, trade liberalization allows more productive firms to expand while less efficient firms either exit or shrink. Melitz (2003) shows that trade can contribute to the Darwinian evolution of industries by forcing the least efficient firms to contract or exit while promoting the growth of the more efficient ones. In studies examining the determinants of survival, firm size and age are highlighted as critical factors with older enterprises having a higher survival rate than new ones (Carroll and Hannan 2000; Nelson and Winter 1982 as cited in Cao 2012).

In studies assessing the impact of trade liberalization on firm survival, the main finding suggests that tariff reduction or elimination together with higher import competition will increase exit. In the US, Bernard and Jensen (2002) showed that import penetration sharply increases the probability of plant death. Bernard, Jensen and Schott (2003) also indicated that lower trade costs increase the probability of plant death, especially for lower productivity, non-exporting plants. In another study,

Bernard, Jensen and Schott (2006) found that plant survival and growth are disproportionately lower in industries with higher exposure to imports from low wage countries.

Couke and Sleuwaegen (2008) indicated that in developed countries, increasing competition from imports from low-wage countries is associated with higher firm level exit, with less productive and more labor-intensive firms being relatively more affected. Looking at the impact the Canada-US Free Trade Agreement (FTA) tariff cuts on Canadian manufacturing firms; Gu, Sawchuk and Whewell (2003) showed that FTA tariff cuts increased the exit rate of Canadian manufacturing firms and the FTA-induced increase in the exit rate was bigger for small firms than for large firms.

In the Philippines, while studies analysing the competitiveness and performance of Philippine SMEs abound, there are very few studies focusing on firm survival and its determinants mainly due to the paucity of micro level data. Using a probit model, Aldaba (2011) examined the determinants of firm exit for Philippine manufacturing enterprises. The results show that individual firm characteristics matter with lower probability of exit associated with highly productive, larger, older, foreign-affiliated and export-oriented firms. This analysis may have masked some of the underlying relationships affecting the survival of SMEs and large manufacturing enterprises. It is important to understand whether there are significant differences in the determinants of survival of SMEs and large enterprises in order to correctly design adjustment policies and programs to increase the survival probability of SMEs. In a highly globalized environment, firms must adapt their strategies to heightened competition in order to survive and benefit from the opportunities offered by globalization (Coucke at al 2010).

This paper aims to understand whether there are differences in the survival of firms the higher their exposure to imports and lower tariffs. Are firms of heterogeneous size affected differently by globalization? Are there differences between factors affecting the survival of SMEs and large enterprises? The paper will be divided into six sections. After the introduction, section II will discuss the policies affecting SMEs along with an analysis of their recent performance and contribution to the economy. Section III will briefly review the literature on the determinants of SME survival particularly on how SMEs are affected by globalization. Section IV

will present the data, variables, and method of estimation applied in the analysis. Section V will analyse the results and on this basis, the final section will formulate the policy implications and recommendations of the paper.

2. SME Policies, Performance and Challenges

Since the 1980s, the Philippines has made considerable progress in opening-up the economy not only by removing tariff and non-tariff barriers but also by deregulating prices, entry and other administrative rules and liberalizing foreign investment restrictions. As a result, the current regime is substantially more open, particularly in the manufacturing industry.

From the early 1980s till the 1990s, the Philippines liberalized its trade policy by reducing tariff rates and removing import quantitative restrictions. Philippine average tariffs are already low with manufacturing at 6.8% and agriculture at 11.2%. About 55% of total tariff lines are clustered around the 0-3% tariff levels and about 29% are found in the 5-10%. In recent years, the uncertainty in the successful conclusion of the World Trade Organization (WTO)'s multilateral trade negotiations has led to a new wave of regionalism through the surge in free trade agreements (FTAs). The Philippines has participated in these initiatives by signing seven free trade agreements covering Japan-Philippines, Korea-ASEAN, China-ASEAN, AFTA, Japan-ASEAN, ASEAN-India and ASEAN-Australia and New Zealand. The government policy on FTAs is to maintain active engagement in several multilateral and bilateral trade and investment agreements. Philippine participation in these agreements is seen to pave the way for the country's deeper trade and investment integration in the global economy.

No unilateral trade reforms took place in recent years as the country's trade policy has been driven mostly by its FTA commitments, particularly the AFTA. Under the ASEAN Trade in Goods Agreement (ATIGA which came into force in 2010), the Philippines has reduced all tariffs to 0-10% except for the highly sensitive agriculture products such as rice. The China-ASEAN FTA (CAFTA) was also implemented on January 1, 2010 simultaneous with the ATIGA. Under CAFTA,

tariffs are expected to be eliminated on 90% of products ranging from textiles to rubber, vegetable oil, and steel between China and the ASEAN 6 (Brunei, Indonesia, Malaysia, Philippines, Thailand, and Singapore). Import duties will be removed on 6682 Chinese products. Average tariffs are reduced to 0.6% (from 9.8% in ASEAN and 12.8% in China).

In terms of foreign direct investment policy, the Philippines changed considerably from a restrictive and complicated regulatory system towards a more open one. Given the need to expand exports and the potential economic contribution of FDI through the transfer of knowledge and experience, the Philippines adopted more open and flexible policies toward FDI. This was carried out simultaneously with the country's market-oriented reforms in the 1990s. In June 1991, the country accelerated the FDI liberalization process through the legislation of Republic Act 7042 or the Foreign Investment Act (FIA).

From the seventies to the present, the overall SME policies and programs have evolved with their focus shifting from inward-looking towards a more external-oriented approach. In the 1990s, government policy on SMEs concentrated on improving market access, export expansion, and increasing competitiveness. In 1991, the Magna Carta for Small Enterprises was passed to consolidate all government programs for the promotion and development of SMEs into a unified framework. The Magna Carta also mandated all lending institutions to set aside 8% of their total loan portfolio to SMEs. Access to finance has remained one of most critical factors affecting the competitiveness of MSMES. Many are unable to qualify for bank loans because they lack the necessary track record and collateral. Moreover, most do not have the financial expertise to manage a healthy cash flow. The lack of credit information has deterred banks from lending to MSMEs.

The 2011-2016 MSME Development Plan focuses on addressing the critical constraints to the growth and development of the MSME sector. Measures will be implemented to create an enabling business environment, improve access to finance, expand market access, and strengthen MSME productivity and competitiveness as well as to deepen linkages with large enterprises and value chain networks. The Plan targets a 40% contribution of the MSME sector to total value added and creation of two million jobs by 2016.

In 2011, micro enterprises dominated the economy accounting for 91% of the total while small enterprises accounted for only 9% (Table 1).[1] Middle enterprises a very small proportion of the total. Since 2003, the total number of enterprises has fallen from 839,114 to 783,165 in 2006. In 2011, this went up to 820,255 but still lower than the total number of enterprises in 2003. In terms of employment contribution, micro enterprises accounted for a share of 28% in 2011 while small enterprises registered a share of 26%. Medium enterprises posted a share of 7% while large enterprises contributed 39% during the same year.

Within manufacturing, micro enterprises accounted for 89% of total establishments while small enterprises recorded a share of 9% in 2011 (Table 2). Medium and large enterprises registered a share of 0.8% and 0.9%, respectively. In terms of employment share, large firms contributed the highest with a share of 53% of the total. Small and medium enterprises contributed 20% and 9% respectively while micro enterprises posted a share of 18%. Medium enterprises constitute a small share not only of the SME sector but also of the overall manufacturing and total Philippine industry structure, such that the country's industrial structure has remained "hollow".

Table 1: Total Number of Enterprises and Employees in the Philippines

Number of Enterprises

Year	Micro	%	Small	%	Medium	%	Large	%	Total
1995	449.950	91	39.848	8	2.712	1	2.447	0,5	495.057
2000	747.740	91	67.166	8	3.070	0,4	2.984	0,4	821.060
2003	762.573	91	69.175	8	3.521	0,4	3.745	0,4	839.114
2006	720.191	92	57.439	7	2.839	0,4	2.596	0,3	783.165
2010	709.899	91	61.979	8	2.786	0,4	3.023	0,4	777.687
2011	743.250	91	70.222	9	3.287	0,4	3.496	0,4	820.255

[1] Micro enterprises have from 1-9 employees. Small enterprises are defined as having 10-99 employees; medium as having 100-199 employees; and large as having over 200 employees (The National Statistics Office and Small and Medium Enterprise Development Council Resolution No. 1, Series 2003).

Number of Employees

Year	Micro	%	Small	%	Medium	%	Large	%	Total
1995	1.345.175	31	945.401	22	366.890	8	1.664.076	39	4.321.603
2000	2.165.100	37	1.522.227	26	416.686	7	1.798.173	30	5.902.256
2003	2.214.278	34	1.556.206	24	485.891	8	2.218.419	34	6.474.860
2006	1.667.824	33	1.279.018	26	381.013	8	1.657.028	33	4.984.950
2010	1.729.100	30	1.417.672	25	386.163	7	2.136.362	38	5.669.297
2011	1.778.353	28	1.642.492	26	451.561	7	2.473.336	39	6.345.742

Source: National Statistics Office.

Table 2: Manufacturing Total Number of Enterprises and Employees

Number of Enterprises

Year	Micro	%	Small	%	Medium	%	Large	%	Total
1995	86.900	89	8.928	9	1.027	1	982	1	97.837
2000	108.998	87	14.121	11	1.110	0,9	1.238	1	125.467
2003	107.398	89	11.910	10	853	0,7	1.024	0,8	121.184
2006	105.083	90	10.274	9	1.004	0,9	985	0,8	117.346
2010	101.072	90	9.471	8	823	0,7	938	0,8	112.304
2011	**100.837**	89	**10.029**	9	**899**	0,8	**1.024**	0,9	**112.789**

Number of Employees

Year	Micro	%	Small	%	Medium	%	Large	%	Total
1995	271699	22	227949	18	137384	11	615874	49	1252906
2000	354025	22	354328	22	150734	9	730127	46	1589214
2003	360576	25	285027	19	118896	8	698173	48	1462672
2006	259664	19	252931	18	132332	10	727984	53	1372911
2010	259.204	20	244.156	19	114.274	9	685.410	53	1.303.044
2011	**253.945**	18	**270.123**	20	**124.524**	9	**724.775**	53	**1.373.367**

Source: National Statistics Office.

While the Philippines has put in place a number of policies and programs designed specifically to boost SME productivity and competitiveness in the country, the performance of SMEs in the last decade has not been vigorous enough to boost the Philippine manufacturing industry. Although some notable improvements in terms of number of enterprises, value added, and employment contribution have been posted, the overall economic performance of SMEs in the last decade has been subdued. Thus, they have not substantially generated sufficient value added and

employment to increase competition, improve industrial structure and increase the country's overall manufacturing growth. The weak performance of SMEs has been largely attributed to the large number of barriers particularly access to finance, access to technology, and skills as well as the presence of information gaps and difficulties with product quality and marketing.

As such, the deepening of high technology industries in terms of the creation of backward linkages has remained weak. Though the country's exports of high technology products have grown rapidly, the value added of these exports is very low due to the limited links of large domestic and foreign companies to the domestic economy. Given rapid changes in the international trade and the growing complexity of global production system, making small and medium manufacturers internationally competitive have posed a significant challenge to Filipino SMEs.

3. Brief Literature Review

In studying the life cycle of an enterprise, there are three major hypotheses that have emerged in the literature: "liability of newness", "liability of adolescence", and "liability of senescence" (Carroll and Hannan 2000; Nelson and Winter 1982 as cited in Cao 2012). The first shows that newer and younger enterprises have a higher rate of death risk than older ones as newer enterprises gradually adapt to the environment, form processes and establish relationships as they grow. The second, the hypothesis of "liability of adolescence", shows that with age, SMEs' death risk follows an inverted U-shape pattern rather than a linear decline over time. Its death risk increases over time until it is able to adapt to the environment when its death risk starts to fall. The hypothesis of "liability of senescence" indicates that older enterprises face an increasing death risk as they find it difficult to adapt to the changing and competitive market environment because they are more rigid than younger enterprises (Baum 1989; Hanna 1998 as cited in Cao 2012). Hence, when an enterprise reaches a certain age, its death risk will once again increase.

In determining the way in which companies are affected by globalization, the literature shows that firm heterogeneity seems to matter decisively. Bernard et al

(2006) and Couke and Sleuwaegen (2008) indicated that in developed countries, increasing competition from imports from low-wage countries is associated with higher firm level exit, with less productive and more labor-intensive firms being relatively more affected. As trade integration deepens, the market selects those firms that are more fit to international competition while their "unfit" counterparts are forced to exit.

Colantone, I., Coucke, and Sleuwaegen (2010) analysed, both theoretically and empirically, the relative competitive position of small and large firms within the same industry in the context of increasing import competition. The authors cited two factors that have traditionally been identified as sources of comparative advantage for small firms relative to their large firm competitors. First, small firms are normally characterized by high marginal cost flexibility. While they tend to produce at higher marginal costs of production at a given point in time, they are also likely to incur lower adjustment costs as demand fluctuates (Brock and Evans 1989, Acs and Audretsch 1990). Second, small firms usually display a strong "niche-filling" attitude. They tend to specialize in specific market-niches as a strategy to make-up for their lack of economies of scale and remain viable (Poter 1980, Dean et al 1998).

The findings of Colantone, I., Coucke, and Sleuwaegen (2010) showed that within the framework of an oligopolistic rivalry model characterized by Cournot competition between domestic and foreign producers, firms of heterogeneous size may be affected differently by diverse sources of import competition. Due to their marginal cost flexibility and ability to specialize in specific market-niche products, small firms may enjoy a relatively favorable competitive position versus their larger counterparts in the face of import penetration from low-wage countries. Following heightened import competition from China and other low wage countries, large domestic firms incur a stronger decrease in survival probabilities than small firms. This is also confirmed by their empirical analysis that looks at firm exit for 12 manufacturing sectors in 8 European countries from 1997 to 2002. Their results showed that firms of different size are affected differently by diverse sources of import competition.

Empirical studies also suggest that lower trading cost through tariff reduction or elimination and higher import competition will increase exit. In assessing the role of

import competition from low wage countries on the survival of US plants, Bernard and Jensen (2002) showed that import penetration sharply increases the probability of plant death. Their results confirmed findings from previous research that plant size, age and productivity are important determinants of plant survival. The probability of plant shutdown is significantly decreasing in plant size, age, and productivity. Exporting plants are far less likely to shut down than non-exporters. Both capital and skill-intensive plants are also less likely to die and death rates are greater for plants with low capital-labor ratios and those with relatively low skilled workers.

Using disaggregated US import data and trade cost, Bernard, Jensen and Schott (2003) examined the impact of changes in tariff and transport costs on industries and plants. Their results highlighted the following: *first*, lower trade costs increase the probability of plant death, especially for lower productivity, non-exporting plants; *second*, surviving high productivity, non-exporters are more likely to enter the export market and expand their sales; and *third*, existing exporters see their exports grow more quickly as trade costs fall. The results showed that the interaction of trade cost and productivity is negative and statistically significant, the probability of death is lower for high productivity plants in the face of falling trade costs. With respect to other plant characteristics, the study indicated that larger, older, and more capital intensive firms are more likely to survive as are plants that pay higher wages or produce multiple products.

In another study, Bernard, Jensen and Schott (2006) examined the role of international trade in the reallocation of US manufacturing within and across industries from 1977 to 1997. Their results indicated that across industries, plant survival and growth are disproportionately lower in industries with higher exposure to imports from low wage countries. Within industries, the higher the exposure to low-wage countries, the bigger is the relative performance difference between capital-intensive plants and labor-intensive plants in terms of survival and growth.

Looking at the impact the Canada-US FTA tariff cuts on Canadian manufacturing firms; Gu, Sawchuk and Whewell (2003) showed that tariff reductions affected productivity growth through its effect on firm turnover. They found that the FTA tariff cuts increased the exit rate of Canadian manufacturing

firms. The FTA-induced increase in the exit rate was bigger for small firms than for large firms which is consistent with the view that the FTA tariff cuts forced the least productive firms to exit. The authors concluded that productivity grows through a mechanism or restructuring process of market selection where low productivity firms exit and are replaced by higher productivity entrants while higher productivity incumbents gain market share.

Using Canadian firm level data, Baggs (2005) also examined the impact of the Canada-US FTA by investigating simultaneously the effect of falling Canadian tariffs and American tariff changes on Canadian firms. The results showed that both firm and industry level characteristics are important determinants of survival and while Canadian tariff reductions reduced the probability of survival, US tariff reductions exhibited the opposite effect. Falling Canadian tariffs decrease the probability of survival since declining domestic protection increase threats. Falling US tariffs increase the probability of survival among Canadian firms since opening foreign markets increase opportunities.

Alvarez and Vergara (2006) analysed the relationship between survival, employment growth and firm size in Chile, an economy that has reduced its trade barriers in the last three decades. Their results showed that compared to firms of the same size in less globalized industries, SMEs are more likely to survive in industries more exposed to external competition. In terms of employment, SMEs are more able to grow in more globalized industries. The other results showed that more productive and older firms are more likely to survive. In terms of factor intensities, skilled labor does not affect survival probability but more capital intensive plants are less likely to shutdown. Compared to large plants, small and medium plants are about 16 and 8 percent less likely to survive. Smaller plants are more likely to exit even controlling for other plant and industry characteristics.

The literature also shows that other factors such as firm level innovations and technological activity are important determinants of firm survival. Ausdretch and Mahmood (1995) showed that small firms that have a relatively higher innovation rate have higher survival rate than large firms. Studies also analysed the relationship between external finance and growth. Hytinen et al (2005) found that firm growth is highly dependent on external finance. Baldwin (1995) indicated that the length of

survival is a function of industry characteristics such as efficiency, concentration, ownership and asset structure. Audretsch (1991) showed that the presence of substantial scale economies and a high capital-labor ratio tends to lower the likelihood of survival. Ausdretsch (1995) further showed that firms that are more capital-intensive often grow faster. Dunne and Hughes (1994) and Mata and Portugal (1994) also both showed a lower likelihood of survival in industries with a high degree of scale economies. In developing countries, Thorsten et al (2002) found that firm growth is determined by legal institutions, corruption and financing and small firms are affected the most. Liedholm and Mead (1998, 1999) examined the data of eight African countries and confirmed that firm age and firm size are important factors in assessing the enterprise life cycle.

In China, Liu and Pang (2003) found that based on China's listed SMEs, firm survival tends to increase with firm size and firm performance and operation stability helps firms become more competitive and more likely to survive and grow. State-ownership was found to increase the probability of large firm survival but not growth. R&D activities were found to influence firm survival but not growth.

In the UK, Holmes, Hunt and Stone (2010) examined the survival of newly established manufacturing firms in north-east England using data on 781 firms and applying log-logistic hazard models separately for (i) micro and (ii) small and medium enterprises. Their results showed that increases in initial plant size are seen to have a positive impact on the survival of SMEs. However, increases in plant size were found to impact negatively on micro-enterprise durations. Ownership of the enterprise was not identified as a significant variable. The results also showed that both micro-enterprises and SMEs exhibited clear evidence of initial positive duration dependence, followed by a negative duration dependence with enterprises displaying increased probabilities of death for the first eight to nine years. Macroeconomic variables such as unemployment, interest and exchange rates were also included in the analysis and the main findings indicated that higher rates of unemployment were not associated with survival chances. For microenterprises, low interest rates at establishment enhance firm survival, while beyond the first year of operation, increases in the real interest and exchange rates impact negatively on survival probabilities.

Facanha, Resende, and Cardoso (2012) investigated the survival of newly created SMEs in Brazilian manufacturing for the period 1996-2005 using a time-varying version of the proportional hazard rate model that controls for unobserved heterogeneity. The main results indicated that firm size, industry size, and industry growth have a positive influence on survival while industrial concentration and entry rate exert a negative influence.

Based on two subsamples of SMEs and applying probit regressions, Nunes and Serrasqueiro (2012) examined whether the survival determinants of young SMEs are different from those of old SMEs. Their results showed that the survival determinants of young SMEs are considerably different from old SMEs with determinants related to scale effects, financial condition and macroeconomic situation explaining their survival. For old SMEs, technological intensity is of greater relative significance.

4. Description of Data and Methodology

4.1 Data

The dataset consists of firm level information from the Annual Survey of Establishments and Census of Establishments of the conducted by the National Statistics Office (NSO). The dataset contains the following variables: sales revenues, employment, compensation, physical capital, exports (only for certain years) and production costs. The firms are identified by unique establishment numbers that allowed the creation of a panel dataset. The dataset covered the period 1996 to 2006, with three missing years in between: 1999, 2001, and 2004. 1996, 1997, 1998, 2002, 2003, and 2005 are surveys years 2000 and 2006 are census years. The dataset includes only firms with at least two observations and excludes all firms with only one observation during the eight-year period 1996-2006. Firms with missing, zero or negative values for any of the variables listed above were dropped as well as those firms with duplicates. These were mostly firms with less than 10 workers. The total number observations is 20,815.

Entry and exit are traced based on the establishment unique numbers. However, there is no information whether exits are due to mergers and acquisitions. Entry and

exit may be due to true entry and exit but may also be due to firms being included in the sample or not. Entry is defined as the year when the firm started its operations. This is based on information provided by the firm. Firm exit is indicated when the firm no longer appears in the dataset. Entry and exit also occurs when a firm's 2-digit PSIC code changes. The firms are classified based on the following definitions:

- New Entrant: firm that enters a given industry sector in a given year t
- Exitor: firm is present in a given year t but will not be present in subsequent year t+1
- Survivor: firm is neither a new entrant nor exitor, it is present in a given year t as well as in subsequent year t+1

Table 3 presents the number of firms in the dataset along with calculated annual entry, exit, and survival rates in the manufacturing industry. The exit rate dropped from 36% in 1997 to about 17% in 2000. This went up to 22% in 2002 and to 24% in 2006. Entry rates are low relative to exit rates declining from 33% in 1996 to about 8% in 1998 and 6% in 2006. The average turnover rate was 24% during the years under review.

Table 3: Summary of Number of Firm Entrants, Exitors, and Survivors

Year	Total	Entrants	Exitors	Survivors	Turnover Rate	As % of total		
		(N)	(X)	(S)	(in %)	N	X	S
1996	2.576	858				33,3		
1997	2.599	9	927	1.663	36	0,4	35,7	64
1998	2.263	177	180	1.906	16	7,8	8	84,2
2000	2.043	28	344	1.671	18	1,4	16,8	81,8
2002	2.072	6	455	1.611	22	0,3	22	77,8
2003	2.031	32	359	1.640	19	1,6	17,7	80,8
2005	3.365	20	505	2.840	16	0,6	15	84,4
2006	3,866*	221	942	2.703	30	5,7	24,4	68,9
Total	20.815	1.351	3.712	14.034	24	6,5	17,8	67,4

**Note*: Firm exit and survival in 2006 were based on whether the firm operated in 2008 as reflected in the 2008 Survey of Business Establishments.

Table 4 shows that exitors are, in general, relatively younger, smaller in terms of employment size, less productive and less capital-intensive than survivors. They seem to be more oriented towards the domestic market with their share of exports to

output lower than survivors. Entrants are larger than exitors in terms number of workers. They are also more capital intensive, more productive and are more export-oriented than exitors. Their tariffs are higher than exitors and survivors.

Table 4: Firm Characteristics of Exitors, New Entrants, and Survivors (Mean Values)

	Exitors	Entrants	Survivors
Export share	0,1258033	0,2374911	0,2117632
TFP	0,9775679	1,000022	1,009972
Tariff	12,23409	17,40083	12,15751
Age	12,26192	2,907476	15,78112
Size: workers	189,2605	267,1088	297,1154
Capital-intensity	129591,1	146782,1	181049,3

It is evident from Table 5 that in terms of firm characteristics, SMEs have lower productivity and are younger, have less workers, more domestic-oriented, have lower capital/worker and lower price cost margin than large enterprises. Mean exit as measured by number of firms that exited as proportion of the total is higher for SMEs at 0.21 compared to 0.12 for large enterprises.

Table 5: Summary Statistics

	All Enterprises			Small and Medium			Large		
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
TFP	20815	1,004	0,113	13938	0,97	0,104	6877	1,069	0,099
Tariff	20815	12,511	8,99	13938	12,24	8,931	6877	13,07	9,09
Age	20806	14,318	16,2	13938	13,997	15,36	6870	14,97	17,78
Size	20815	275,934	648,353	13938	66,75	49,73	6877	699,895	999,49
Export	13341	0,199	0,378	9036	0,15	0,335	4305	0,31	0,4359867
KL	20815	169648,5	830337	13938	141190,5	804137,9	6877	227326	878286
PCM	20813	0,188	0,12	13938	0,182	0,116	6875	0,2	0,127
Exit	20815	0,178333	0,382802	13938	0,207921	0,405834	6877	0,118366	0,32064

4.2 Methodology

To examine whether firms of different size are affected differently by globalization, a probit model is estimated where the dependent variable is set to one

if the firm exited and zero if it survives the next year. Globalization will be indicated by trade liberalization using tariffs and effective protection rates as proxy variables.

As earlier discussed, there is already a large body of literature examining the determinants of firm survival. In many of these studies, the importance of firm characteristics such as age, size, wage, and R&D as well as industry features such as capital intensity, productivity, industry growth and concentration have been highlighted (see Ferragina et al 2010).

The baseline model specified below will be estimated separately for SMEs and large enterprises. The criterion used for defining SMEs is the total number of employees. In the Philippines, SMEs are defined as enterprises with 10 to 199 workers while large enterprises are those employing 200 or more workers. The baseline model is given by:

$$\Pr(exit_{it} = 1) = F\begin{pmatrix} TRADE_{jt}, TFP_{it}, OWNERSHIP_{it}, AGE_{it}, SIZE_{it}, EXPORT_{it}, KL_{it}, \\ PCM_{jt}, R\&D_{it}, Subsidy_{it}, Dummy\ Variables \end{pmatrix} \quad (1)$$

where *i* indexes firms, *j* industry, and *t* year. The explanatory variables include firm-level controls such as productivity (*TFP*), foreign ownership (*OWNERSHIP*), age (*AGE*), number of workers (*SIZE*), export (*EXPORT*), capital intensity (*KL*), price cost margin (PCM), R&D and subsidy indicators along with industry and year dummies.

To capture firm heterogeneity, firm size was interacted with tariffs (*SIZE*Tariff*) and effective protection rates (*SIZE*EPR*) as well as with firm characteristics such as ownership (*SIZE*OWNERSHIP*) and export (*SIZE*EXPORT*).

TRADE is the trade policy variable proxied by tariff rates and effective protection rates (EPRs) in sector *j*. Effective protection rates take into account both the tariff on the firm's output and the tariffs on the inputs that the firm uses. EPRs are important because tariffs vary considerably along the production stage generally exhibiting an escalating structure with inputs having lower protection while final goods receive higher protection. It is assumed that liberalization tends to suggest a negative effect on the exit rate and a positive effect on firm survival. This implies

that a lower (higher) tariff or EPR increases (decreases) the probability of exit and reduces (increases) the firm's survival likelihood.

TFP is the firm's total factor productivity defined as the residual of a Cobb-Douglas production function and estimated using the methodology of Levinsohn and Petrin (2003). In estimating the production function, data on value added (output less cost of materials and energy) and two factors of production, labor and capital, were used. Fuel and electricity data were employed as proxy for productivity shocks.[2] A production function was estimated for 11 industry-sectors. The estimates of firm i's TFP is obtained by subtracting firm i's predicted y from its actual y at time t. To make the estimated TFP comparable across industry-sectors, a productivity index is created. Firms with higher productivity are expected to have higher survival rates.

OWNERSHIP is an indicator of firm ownership, it is equal to 1 if the firm has 10% or more foreign equity. Higher foreign equity participation decreases the probability of exit and has a positive effect on survival.

AGE is the difference between year t and the year the firm started its operations. It is expected that the probability of exit declines with the age of the firm. As earlier discussed, there are three major hypotheses in the literature. The hypothesis of "liability of newness" shows that newer and younger enterprises have a higher rate of death risk than older ones because newer enterprises must gradually adapt to the environment and establish themselves over time. The hypothesis of "liability of adolescence" shows that with age, SMEs' death risk follows an inverted U-shape pattern rather than a linear decline over time. In the enterprise's life cycle, its death risk increases over time and until it is able to adapt to the environment when its death risk starts to fall. The hypothesis of "liability of senescence" indicates that older enterprises face an increasing death risk as they find it difficult to adapt to the changing and competitive market environment because they are more rigid than younger enterprises. When an enterprise reaches a certain age, its death risk will once again increase.

[2] To address the simultaneity problem in input choice when estimating the production function by ordinary least squares (OLS), a semi-parametric estimator with an instrument to control for unobserved productivity shocks is applied. For this instrument, Olley and Pakes (1996) use investment while Levinsohn and Petrin (2002) suggest the use of intermediate inputs.

SIZE is measured by total number of workers. In most studies, firm size is reported to have an important role in explaining survival particularly in relation to scale efficiency. Larger firms are more likely to have levels of output close to the minimum efficient scale (MES), *ceteris paribus*, and thus smaller firms have an inherent size advantage (P. Holmes, et al 2010). Most studies suggest a positive relationship between plant size and survival (Audretsch and Mahmood, 1995; McCloughan and Stone, 1998; Disney et al, 2003; Perez et al 2004; Persson, 2004).

EXPORT is a ratio of the firm's total exports to total output. A negative coefficient is expected indicating that a higher export ratio reduces the probability of exit.

KL is capital intensity measured as the ratio of the book value of assets to total workers. It is expected that with high capital intensity, the probability of exit declines.

PCM is price cost margin, which following Aghion et al (2002), is used as an indicator of product market competition. The PCM is an indicator of the level of competition or degree of monopoly power of firms in industries. Note that while high PCM implies market power, it could also indicate high firm efficiency particularly if these high mark-ups or margins are the result of internal efficiency improving measures or represent gains from product innovation or techniques that a firm employs.

The PCM is measured as [Total Revenue-Compensation-Total Cost-Financial Cost of Capital]/Total Revenue where Total Cost is the sum of raw materials, fuel, electricity, depreciation and other costs while the Financial Cost of Capital=[Index of Investment Goods*Real Interest Rate]*Book Value of Assets.

The degree of competition measured by concentration ratio is expected to have an impact on firm survival with the general argument that increased concentration in the industry will make the environment more difficult for new entrants, leading to greater risk of failure (P. Holmes et al 2010). However, the results in the empirical literature are quite mixed, while Balwin and Rafiquzzaman (1995) and McCloughan and Stone (1998) find a significant relationship between concentration and firm duration, Wagner (1994) finds no such relationship for German manufacturing. P. Holmes et al (2010) obtained the same finding as Wagner (1994).

R&D is a research and development expenditure dummy variable reported by the firm and which is used as proxy for innovation. R&D expenditures refer to amount spent on any systematic and creative work undertaken to increase the stock knowledge and the use of the knowledge to devise new applications (NSO, 2000 Census of Philippine Business and Industry).

Subsidy is a dummy variable representing that the firm is a recipient of fiscal assistance or support from the government. Subsidies are defined as special grants in the form of financial assistance or tax exemption or tax privilege received from the government to aid and develop an industry. These include tax credit, tax and duty exemptions, price support, interest rate subsidy and price discount (NSO, 2000 Census of Philippine Business and Industry).

The summary statistics of the covariates are presented in Table 5. The same dataset will also be used to provide a detailed examination of the duration of survival of SMEs and large enterprises and whether there are considerable differences between factors affecting the survival of SMEs and those affecting large enterprises. The duration of the life of a firm is important in examining the factors affecting firm survival. One major problem encountered in analysing duration data is censored data (most commonly encountered form is right censoring) which refers to firms that are still alive or surviving at the time when the data was last collected. Ordinary regression models cannot correctly incorporate information from both censored and uncensored data in estimating parameters.

To overcome the problems caused by censored data, survival models are applied. Using a hazard rate approach, survival models consider not only whether a firm will stop operating but also the length of time the firm has operated. The hazard rate model of the duration of the life of a firm provides a statistical representation of the relation between the survival time of a firm and certain explanatory variables or covariates. This involves modelling the conditional probability that a firm will stop operating over a specified period of time. The hazard rate can be thought of as the rate at which firms die after duration *t*, given that they survive at least until time *t* (Holmes et al 2010).

A survival analysis technique will be tested using a Cox Proportional Hazards model to be estimated as follows:

$$h(t) = h_0(t)e^{(\beta_i X_i)}$$

.....(2)

where *h(t)* is the rate at which firms exit at time *t* given that they have survived in *t-1* and h_0 is the baseline hazard function (the parametric form of which is not specified) when all of the covariates are set to zero. The covariates or explanatory variables X_i measure the impact of policy as well as firm and sector characteristics on firm survival. Interaction terms (SIZE*TRADE, SIZE*OWNERSHIP, SIZE*EXPORT) are also introduced in the model.

Each independent variable coefficient, β_i (i=1,2…n), estimates the change in the hazard rate of a one-unit change in the given independent variable, holding all other variables in the model constant. The hazard ratio can be expressed as $e^{\beta i}$, indicating the effect of a one-unit change in the independent variable on the hazard function h(t) or the exit probability. A hazard ratio of 1.0 that suggests a one unit change in the independent variable has no effect on the likelihood of exit holding all other variables constant. A hazard ratio of less (more) than 1.0 suggests a lower (higher) likelihood of exit.

5. Empirical Results

5.1. Probit Model

Tables 6a and 6b present the results for the Probit model estimation for all enterprises and SMEs and large enterprises, respectively. Using tariffs as trade proxy variable and without interaction terms, Table 6a Model 1 shows that firm size is negatively correlated with the probability of exit indicating that smaller firms are more likely to exit. The results also show that firms that are more productive, older, with foreign ownership, and engaged in export activities are less likely to exit. Capital intensity, though it has a negative coefficient, is not statistically significant. The coefficient on PCM is negative but is not statistically significant and while the coefficient on R&D is negative, it is not significant. Firm subsidy is negatively

correlated with the probability of exit and is highly significant. Meanwhile, the coefficient on tariff is negative and highly significant indicating that lower tariffs are associated with higher probability of firm exit.

Table 6a: Firm Exit, Probit Regressions: All Enterprises

	Tariff		Effective Protection Rate	
Variables	Model 1	Model 2	Model 3	Model 4
TFP	-1.047244*** (.1425722)	-1.081724*** (.1529636)	-1.004758*** (0.1419652)	-1.054157*** (0.1520611)
Trade	-.0091453*** (.0020584)	-0.006943*** (0.0021641)	0.0000178 (0.0007349)	0.0005352 (0.0009306)
Age	-.0052233*** (.000887)5	-0.0049492*** (0.0008919)	-0.0050008*** (0.0008828)	-0.0047668*** (0.0008868)
Export	-.3598736*** (.0466114)	-.3763548*** (0.0517314)	-0.3581515*** (0.046579)	-0.4021739*** (0.0512962)
Ownership	-.1595802*** (.0382081)	-.1646349*** (0.0428813)	-0.152594*** (0.0381538)	-0.1647362*** (0.0429594)
Size	-.0000957*** (.0000316)	-0.001418*** (0.0003756)	-0.0000975*** (0.0000317)	-0.0017592*** (0.0003501)
PCM	-.1197328 (.1251199)	-0.1452372 (0.1251877)	-0.1200158 (0.125423)	-0.1490802 (0.1254149)
KL	-1.83e-08 (2.31e-08)	-2.42e-08 (2.43e-08)	-1.30e-08 (2.15e-08)	-1,69E-08 (0.0000000224)
Subsidy	-.1198715*** (.0378025)	-0.1130349*** (0.0378696)	-0.1934975*** (0.0341531)	-0.185377*** (0.0342471)
R&D	-.0997363 (.0635185)	-0.1082948* (0.0638537)	-0.0949012 (0.0634787)	-0.0949576 (0.063696)
Size*trade		-0.0000114*** (4.02e-06)		-0,000000827 (0.00000101)
Size*Ownership		0.0001023 (0.000070)1		0.0001323* (0.0000699)
Size*Export		0.000096 (0.0000705)		0.0002086*** (0.0000628)
Size*TFP		0.0011636*** (0.0003223)		0.0013002*** (0.0003109)
Year	Y	Y	Y	Y
Industry	Y	Y	Y	Y
Obs	11964	11964	11964	11964
Log likelihood	-5110,3628	-5086,7056	-5120,4061	-5100,0844

Notes: Size is measured by number of workers. ***significant at 1%, ** significant at 5% and * significant at 10%. Numbers in parentheses are error terms while coefficients represent marginal effects (dy/dx).

Model 2 presents the results with the introduction of interaction variables. The coefficient on the interaction between size and tariff shows a highly significant negative coefficient indicating that not only do tariff reductions increase the probability of firm exit but this negative effect of tariff is even larger for small firms. Size was also interacted with ownership and export but the coefficients are not statistically significant. The final interaction term is productivity and the results show a highly significant positive coefficient indicating that lower probability of exit is associated with highly productive small firms.

The results obtained for the other control variables are the same as those obtained earlier. Productivity, age, export, foreign ownership, and subsidy are important determinants of firm exit. In particular, exit is lower for firms that are older, with high productivity level, with high export shares, have foreign equity, and receive government subsidy. The results also show a significant negative coefficient on R&D indicating that lower probability of exit is associated with firms that have R&D activities.

Models 3 and 4 use effective protection rate as trade policy variable. In both models, however, the coefficient on EPR is positive but not significant. For the control variables, the same basic results are obtained with older, larger, more productive, exporting firms, and firms that receive government subsidy being less likely to exit. For the interaction terms, the results show that lower probability of exit is associated with small firms that export, have foreign equity, and have high productivity level. This indicates that while small firm size is correlated with higher probability of exit, this can be mitigated for firms with higher exports, have foreign equity, and higher level of productivity.

Table 6B presents the probit results explaining the probability of exit for SMEs and large enterprises. For SMEs using tariff as trade policy variable, the results indicate the same general findings with larger, older, and more productive firms being less likely to exit. Firms with foreign ownership as well as those that are export-oriented are also less likely to exit. The coefficient on tariff is negative and highly significant indicating that firms facing reduced tariffs on their products are more likely to exit. PCM, capital intensity, subsidy, and R&D are not significant (Model 1).

Table 6b: Firm Exit, Probit Regressions by Size

	SMEs		Large Enterprises	
Variables	Tariff (Model1)	EPR (Model 2)	Tariff (Model 3)	EPR (Model 4)
TFP	-0.745647*** (0.1662213)	-0.698467*** (0.1657536)	-0.4541954 (0.3394225)	-0.4155275 (0.3379418)
Trade	-0.0072473*** (0.0023317)	-0.0003142 (0.0010683)	-0.0152819 *** (0.0046655)	0.000595 (0.001196)
Age	-0.005743*** (0.0010881)	-0.0055342*** (0.0010834)	-0.0020324 (0.0015726)	-0.0018522 (0.0015593)
Export	-0.3453928*** (0.0599165)	-0.3453696*** (0.0598976)	-0.4014646*** (0.0788897)	-0.3867686*** (0.0785919)
Ownership	-0.1351471*** (0.0500852)	-0.1261903*** (0.049986)6	-0.0752524 (0.0643945)	-0.0680808 (0.06424)
PCM	-0.1110403 (0.1491764)	-0.1155588 (0.1494533)	-0.1230318 (0.2476057)	-0.1060085 (0.2488562)
KL	-5.06e-09 (2.18e-08)	-2.84e-09 (2.10e-08)	-1.99e-07** (8.43e-08)	-1.78e-07** (8.34e-08)
Subsidy	-0.0548808 (0.0445656)	-0.1161833*** (0.0400493)	-0.255653*** (0.0743938)	-0.3487164*** (0.0692689)
R&D	-0.0754337 (0.0829556)	-0.0716218 (0.0829817)	-0.176838* (0.1013023)	-0.1624211 (0.1010247)
Year	Y	Y	Y	Y
Industry	Y	Y	Y	Y
Obs	7925	7925	4039	4039
Log likelihood	-3847,5155	-3852,3566	-1192,6463	-1198,1152

Notes: ***significant at 1%, ** significant at 5% and * significant at 10%. Numbers in parentheses are error terms while coefficients represent marginal effects (dy/dx).

Using EPR as globalization variable, the results show that the negative coefficient on EPR is not significant. For firm characteristics, the findings confirm the earlier results. For SMEs, low probability of exit is associated with firms that are older, more productive, able to export, have foreign ownership, and receive government subsidy (Model 2).

For large enterprises, the results show that the coefficient on the trade variable is negative and highly significant only in Model 3. Though the coefficient on TFP is negative it is not statistically significant both models. Capital-intensity is significant with its negative coefficient indicating that more capital-intensive firms are less likely to exit. Export and subsidy are significant in both models. The coefficient on foreign ownership, though negative, is not statistically significant. The coefficient on R&D is negative and significant only in Model 3.

Using tariff as globalization variable, the results show that for both SMEs and large enterprises, the coefficient on tariff is negative indicating that firms facing reduced tariffs on their products are more likely to exit. The results highlight the importance of improving productivity, allowing foreign ownership, and engaging in export activities to increase the probability of SME survival. For large enterprises, R&D, capital intensity and export-orientation are significant determinants of survival.

5.1. Non-parametric Analysis

When no covariates exist or when covariates are qualitative in nature, non-parametric methods like Kaplan and Meier can be applied to estimate the probability of survival past a certain time. Figures 1a and 1b show the Kaplan and Meier estimates of firm survivor function or the probability of survival until time t. The left graph Figure 1A shows that survival of manufacturing firms in the Philippines declines immediately from the first year leaving the survival probability around 86% (see Table 7). At the end of the eleventh year, only 42% of the sample firms are still surviving.

Figure: 1a

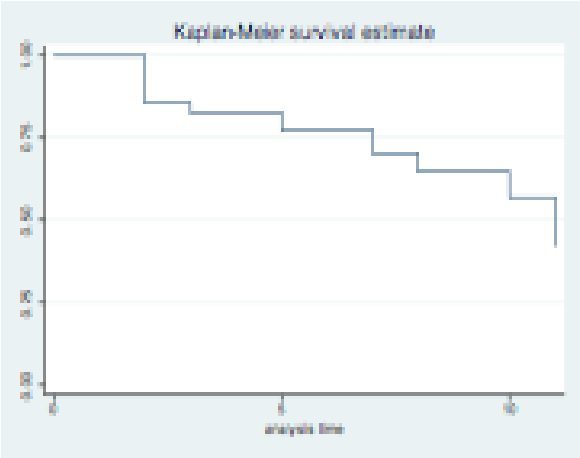
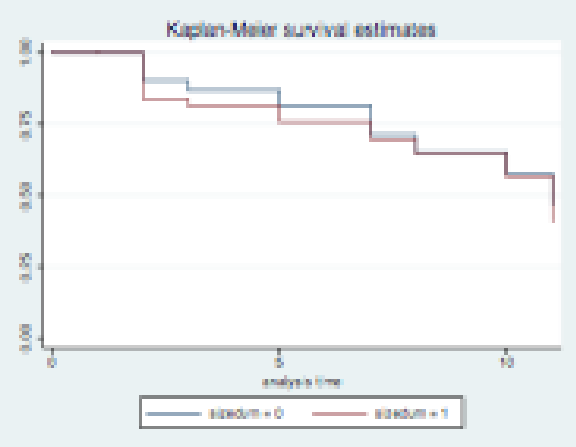


Figure: 1b



The right graph Figure 1b compares the survival probabilities of SMEs and large enterprises. After the first year, the survival probabilities of both decline with large enterprises having higher probabilities of survival. A log-rank test for equality was conducted to compare the survival experience of the two groups of firms. The result showed a significant difference between the two survivor functions (p-value is 0.0003 and the null hypothesis of equality is rejected).

Table 7: Survivor Function

Time	ALL	SMEs	Large Enterprises
2	0,855	0,8393	0,903
3	0,8269	0,8134	0,8682
5	0,7735	0,7595	0,8163
7	0,7023	0,6985	0,7128
8	0,6467	0,6444	0,6522
10	0,5693	0,5668	0,5758
11	0,4213	0,4075	0,4672

5.1 Semi-parametric Analysis: Cox Proportional Hazards Model

Tables 8 and 9 show the results estimated for two groups: all enterprises (Tables 8a and 8b) and SMEs and large enterprises (Tables 9a and 9b). Tables 8a and 9a present the results containing the Cox regression coefficients while Tables 8b and 9b

contain the hazard ratios estimates calculated from the coefficients (exponentiated coefficients).[3] A hazard ratio greater than one is interpreted as decreasing firm survival, ceteris paribus, or if it is less than one it is increasing firm survival, all other things held constant.

The results in Table 8a, which cover all enterprises, show that larger, older, and more productive firms are less likely to exit. Firms that export, have foreign ownership as well as those that engage in R&D activities are also less likely to exit. These results are generally consistent with the earlier findings based on the probit regressions earlier presented. For capital intensity and PCM, the coefficients are not significant in both models using tariff and EPR as trade variables.

For tariff, the results show that firms in liberalized industries are less likely to exit. This is not consistent with the earlier Probit regression result which showed that the probability of exit is negatively associated with tariff reduction. For subsidy, the results are also not consistent with the earlier results. For the interaction terms, the results are the same as those obtained using Probit regression. Table 8b shows that tariffs, EPRs, and subsidy reduce firm survival while TFP, Age, Export, Ownership, R&D, and Size increase firm survival.

[3] This shows a difference only in how results are reported but not in the results themselves.

Table 8a: Cox Regression Coefficients: All Enterprises

	Tariff		Effective Protection Rate	
Variables	Model 1	Model 2	Model 3	Model 4
TFP	-1.282465*** (0.2326023)	-1.268221*** (0.24927)	-1.305329*** (0.2324436)	-1.320246*** (0.2482345)
Trade	0.0118659*** (0.0033614)	0.0146819*** (0.0035288)	0.0034157** (0.0014337)	0.0045196*** (0.0015842)
Age	-0.0124783*** (0.0018497)	-0.0122047*** (0.0018583)	-0.0127375*** (0.0018511)	-0.012554*** (0.0018606)
Export	-0.1708526** (0.0862863)	-0.2091858** (0.0940029)	-0.1780997** (0.0862421)	-0.2395161*** (0.0943428)
Ownership	-0.2982231*** (0.0657143)	-0.2842318*** (0.075896)	-0.2981939*** (0.065726)	-0.3018069*** (0.0760727)
Size	-0.0002116*** (0.0000715)	-0.0020188*** (0.000742)	-0.0002116*** (0.0000714)	-0.0025278*** (0.0006623)
PCM	-0.0990906 (0.2025448)	-0.1096344 (0.2024222)	-0.081342 (0.2017234)	-0.1042922 (0.2011097)
KL	-6,61E-09 (0.0000000382)	-1.68e-08 (4.07e-08)	-1,09E-08 (0.0000000395)	-1.91e-08 (4.14e-08)
Subsidy	0.9053235*** (0.1038228)	0.9080318*** (0.1034824)	0.9330335*** (0.103237)	0.9392586** (0.1028273)
R&D	-0.2175792** (0.111292)	-0.2286217** (0.1120463)	-0.2159311** (0.1112454)	-0.2231774* (0.1119451)
Size*trade		-.00002** (0.00000883)		-3.36e-06* (1.97e-06)
Size*Ownership		0.0000932 (0.0001575)		0.0001627 (0.0001584)
Size*Export		0.000159 (0.0001397)		0.0003113** (0.0001314)
Size*TFP		0.0016375** (0.0006317)		0 .00185*** (0.0005961)
Year	Y	Y	Y	Y
Industry	Y	Y	Y	Y
Obs	11753	11753	11753	11753
Log likelihood	-15546,413	-15529,819	-15549,679	-15535,037
Test of proportional-hazards assumption	chi2 74.92 Prob>chi2 0	chi2 66.56 Prob>chi2 0	chi2 74.67 Prob>chi2 0	chi2 67.84 Prob>chi2 0

Notes: ***significant at 1%, ** significant at 5% and * significant at 10%. Numbers in parentheses are error terms.

Table 8b: Cox Hazards Function Estimation Results: All Enterprises

	Tariff		Effective Protection Rate	
Variables	Model 1	Model 2	Model 3	Model 4
TFP	0.2773527*** (0.0645129)	0.2813318*** (0.0701276)	0.2710834*** (0.0630116)	0.2670696*** (0.0662959)
Trade	1.011937*** (0.0034015)	1.01479*** (0.003581)	1.003422** (0 .0014386)	1.00453*** (0.0015914)
Age	0.9875992*** (0.0018268)	.9878695*** .001835 8	.9873432*** (0.0018277)	.9875245*** (0.0018374)
Export	.8429458** .072734 6	0.8112445** (0.0762593)	0.836859** (0.0721725)	0.7870086*** (0.0742486)
Ownership	0.7421357*** (0.0487689)	0.7525921*** (0.0571187)	0.7421574*** (0.0487791)	0.7394808*** (0.0562543)
Size	0.9997884*** (0.0000715)	0.9979832*** (0.0007405)	0.9997884*** (0.0000714)	0.9974754*** (0.0006606)
PCM	0.9056606 (0.1834369)	0.8961617 (0.181403)	0,9218783 (0.1859644)	0.900962 (0.1811922)
KL	1 (0.0000000382)	1 (0.0000000407)	1 (0.0000000395)	1 (0.0000000414)
Subsidy	2.472732*** (0.2567259)	2.479438*** (0.2565782)	2.542209*** (0.2624501)	2.558084*** (0.263041)
R&D	0.8044639** (0.0895304)	0.7956295** (0.0891473)	0.8057908** (0.0896406)	0.7999729** (0.089553)
Size*trade		0.99998** (0.00000883)		0.9999966* (0.00000197)
Size*Ownership		1.000093 (0.0001575)		1.000163 (0.0001584)
Size*Export		1.000159 (0.0001397)		1.000311** (0.0001314)
Size*TFP		1.001639*** (0.0006328)		1.001852*** (0.0005972)

Notes: Size Dummy is equal to 1 if firm is SME and 0 otherwise. ***significant at 1%, ** significant at 5% and * significant at 10%. Numbers in parentheses are error terms.

One of the main assumptions of the Cox proportional hazard model is proportionality[4]. Using the Schoenfeld residuals or phtest in Stata, the proportionality of the model as a whole is tested (null hypothesis is the proportional hazards or PH assumption holds for all variables). If the tests are not significant (p-value over 0.05), then we cannot reject proportionality and we assume we do not have a violation of

[4] A key assumption of the Cox model is that the hazard rates for two observations are proportional to one another and that proportionality is maintained over time. The relative hazard for any two observations I and j must obey the following relationship: $\frac{h_o(t)e^{X_i\beta}}{h_o(t)e^{X_j\beta}} = \frac{e^{X_i\beta}}{e^{X_j\beta}}$

the proportional assumption.[5] The results show that in all four models, the proportionality assumption is violated. Note that given the violation of the proportional hazard assumption, great care must be exercised in interpreting the results. Violation of the proportional hazard assumption would tend to overestimate the effect of variables whose hazard ratios are increasing over time and underestimate the effect of variables whose hazard ratios are decreasing.

Table 9a examines the survival of SMEs and large enterprises. In Models (1) and (2) using tariffs, the results show that older and more productive firms are less likely to exit. Firms that export and have foreign equity are also less likely to exit. However, for subsidy and tariffs, the results are not the same as those obtained using Probit regression. The Cox regression results show that firms receiving government subsidy are more likely to exit while tariff is positively associated with the probability of exit. Table 9b shows that for SMEs, tariffs and subsidy increase firm survival while TFP, Age, Export, and Ownership decrease firm survival. Note, however, that in both models based on tariffs and EPR, the proportionality assumption is violated.

For large enterprises, the results show that capital-intensive firms and those engaged in R&D and export activities are less likely to exit. The results also indicate that while productivity, age and size have the correct signs, they are not significant. Tariffs, subsidy, and PCM are also not significant. Based on the hypothesis of "liability of senescence", elder enterprises that cannot better adapt to the changing and competitive environment because they are more rigid than the younger enterprises are again faced with death risk increases. This may explain the importance of capital-intensity, foreign partnership, and R&D activities to the survival of large enterprises to help them in adjusting to the changing and highly competitive market environment.

[5] http://www.ats.ucla.edu/STAT/stata/seminars/stata_survival/default.htm

Table 9A: Cox Regression Coefficients by Size

	SMEs		Large Enterprises	
Variables	Tariff (Model 1)	EPR (Model 2)	Tariff (Model 3)	EPR (Model 4)
TFP	-1.067301*** (0.2572119)	-1.096158*** (0.257092)	-0.2461041 (0.6336783)	-0.2371803 (0.6336249)
Trade	0.0126339*** (0.0036184)	0.0037748** (0.0017184)	0.0032592 (0.0090646)	0.0032434 (0.0027427)
Age	-0.0133611*** (0.0021591)	-0.0136428*** (0.0021617)	-0.0048546 (0.0034741)	-0.0049709 (0.0034703)
Export	-0.1847539* (0.1048389)	-0.1895398* (0.1047557)	-0.2833838* (0.1623095)	-0.2872382* 0.1619031
Ownership	- .2479716*** .0815659	- .2551554*** .0814813	-0.1803728 (0.1197515)	-0.1730197 (0.1200182)
PCM	0.0956431 (0.231748)	0.1135925 (0.2302657)	-0.4267731 (0.4561601)	-0.4192014 (0.4572815)
KL	2.01e-08 (3.36e-08)	1.76e-08 (3.50e-08)	- 0.000000319* (0.000000169)	- 0.000000321* (0.000000169)
Subsidy	1.255046*** (0.1234556)	1.287554*** (0.122512)	0.0503866 (0.1968305)	0.0549929 (0.1968498)
R&D	-0.1749905 (0.1373236)	-0.1795886 (0.1372452)	-0.3679606* (0.1923418)	-0.3627136* (0.1924064)
Year	Y	Y	Y	Y
Industry	Y	Y	Y	Y
Obs	7785	7785	3968	3968
Log likelihood	-12065,056	-12068,687	-2463,3978	-2462,702
Test of proportional-hazards assumption	chi2 58.14 Prob>chi2 0	chi2 59.24 Prob>chi2 0	chi2 20.37 Prob>chi2 0,4982	chi2 17.79 Prob>chi2 0,6621

Notes: ***significant at 1%, ** significant at 5% and * significant at 10%. Numbers in parentheses are error terms.

Table 9b: Cox Hazards Function Estimation Results by Size

	SMEs		Large Enterprises	
Variables	Tariff (Model 1)	EPR (Model 2)	Tariff (Model 3)	EPR (Model 4)
TFP	0.3439355*** (0.0884643)	0.3341525*** (0.0859079)	0.7818408 (0.4954356)	0.7888491 (0.4998344)
Trade	1.012714*** (0.0036644)	1.003782** .0017249	1.003265 .0090942	1.003249 (0.0027517)
Age	0.9867278*** .0021305	0.9864498*** (0.0021324)	0.9951572 (0.0034572)	0.9950415 (0.0034531)
Export	0.8313088* (0.0871535)	0.8273398* (0.0866685)	0.7532307* (0.1222565)	0.750333* (0.1214813)
Ownership	0.7803821*** (0.0636525)	0.7747961*** (0.0631314)	0.8349589 (0.0999876)	0.8411211 (0.1009498)
PCM	1.100366 (0.2550076)	1.120295 (0.2579656)	0.6526116 (0.2976954)	0.6575718 (0.3006954)
KL	1 (0.0000000336)	1 (0.000000035)	0.9999997* (1.69e-07)	0.9999997* (1.69e-07)
Subsidy	3.507999*** (0.4330823)	3.623913*** (0.4439728)	1.051678 (0.2070022)	1.056533 (0.2079783)
R&D	0.839465 (0.1152783)	0.8356139 (0.114684)	0.6921444* (0.1331283)	0.6957857* (0.1338736)

Notes: ***significant at 1%, ** significant at 5% and * significant at 10%. Numbers in parentheses are error terms.

Table 9b shows that for large enterprises, the results show that Export, capital intensity (though the hazard ratio is very close to 1), and R&D increase firm survival. The hazard ratios of Trade and Subsidy are greater than one, but are not statistically significant. The proportionality of the model as a whole was tested. For both Models 3 and 4, the proportionality assumption is not violated (given the p-values of 0.4982 and 0.6621, respectively)[6] indicating that proportionality cannot be rejected.

[6] P-value less than 0.05 indicate violation of proportional hazards assumption.

6. Conclustions and Policy Implications

The paper aims to examine the relationship between globalization and the survival of SMEs using both tariffs and effective protection rates as globalization proxy variables. These are added to the factors that affect firm exit consisting of firm characteristics such as age, size, productivity, capital intensity, ownership, export, and R&D. Government subsidy and price cost margins at the industry level are also included. To capture firm heterogeneity, firm size was interacted with tariffs and effective protection rates as well as with firm characteristics such as productivity, ownership and export.

Data on the Philippine manufacturing industry covering eight years from 1996 to 2006 are used in the empirical analysis. Two estimation methods are employed: Probit and Cox proportional hazard models. However, given the violation of the proportionality assumption, the results of the Cox regression must be interpreted with care. The Probit results confirm previous research finding that firm size, age, and productivity are important determinants of firm exit. Controlling for these attributes, the results show that tariffs are negatively correlated with firm exit and in the face of tariff reduction, the probability of exit is higher for small firms. Firm exit is greater for small enterprises characterized by low productivity, non-exporter and without foreign equity. Firms that have high level of productivity, engage in export activities and have foreign equity are better able to survive. These suggest that firm characteristics such as high productivity level, exports, and ownership structure can mitigate the effects of declining tariffs.

For the other control variables, the results show that firm subsidy is negatively correlated with the probability of exit and is highly significant. The results also show a significant negative coefficient on R&D indicating that lower probability of exit is associated with firms that have R&D activities.

The dataset was further divided into two groups: SMEs and large enterprises and analyzed the determinants of survival for each group separately. Using tariff as globalization variable, the results indicate the same general findings with older and more productive firms being less likely to exit. Firms with foreign ownership as well as those that are export-oriented are also less likely to exit. The coefficient on tariff is

negative and highly significant indicating that firms facing reduced tariffs on their products are more likely to exit.

SMEs face a number of constraints such as scale disadvantage, lack of high-level employees, and financial access. To grow and adapt to the market environment and increase their survival probability, they need to increase their size. As many previous studies suggest, larger firms are more likely to have levels of output close to the minimum efficient scale (MES), ceteris paribus, hence smaller firms have an inherent size disadvantage (Holmes, Hunt, and Stone, 2010). Apart from scale disadvantage, smaller firms also suffer from lack of financial access. It is important to note that firms with foreign equity are more likely to survive due to the financial backing which is likely to be provided by the foreign partner.

Meanwhile, for large enterprises, the results show that the coefficient on the trade variable is negative and highly significant. Capital-intensity is significant with its negative coefficient indicating that more capital-intensive firms are less likely to exit. Export, subsidy, and R&D are also significant. The Cox regression results also show that for large enterprises, capital-intensive firms and those engaged in R&D and export activities are less likely to exit. Large enterprises must continue to learn to adapt quickly to the highly changing competitive environment by upgrading and innovating because as the "liability of senescence" shows, upon reaching a certain age, enterprises again face a rising death risk.

All these tend to show that in a more open trade and investment policy regime, firms need to adopt efficient methods to reduce cost, improve quality and enable more productive firms to grow more rapidly and increase their survival. It is widely accepted that multinational firms are a vital source of international capital and technology and their entry can facilitate the transfer of technical and business know-how resulting in productivity gains and competitiveness among domestic firms. The entry of multinational firms may also increase competition and force domestic firms to imitate and innovate. Multinationals also have established global or regional production bases where domestic firms can link with by serving as potential suppliers. With their extensive marketing networks, multinational firms also have the potential of making significant contributions to facilitating the marketing of exports of their domestic partners.

Government SME policy should be directed towards measures that would enhance firm productivity and attracting more foreign direct investment especially those that would improve SME linkages with multinational companies. Deepening linkages with multinational firms' international production networks would be important in realizing the potential gains from the trade and investment liberalization arising from regional economic integration through the ASEAN Economic Community. At the same time, policies should focus on carefully crafted support programs that would improve SME productivity to help them grow and develop. For large enterprises, policies should be directed on programs that would enhance innovation and upgrading activities.

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