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Survival of the fittest: tourism exposure and firm survival

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ABSTRACT

In this article, a discrete-time hazard model to study firm survival in the Portuguese Tourism sector is estimated. This sector has experienced a remarkable performance over the last decades. Results show that when compared to other sectors, tourism firms are more likely to exit: (i) if they are young (less than 10 years of existence); and (ii) if they belong to the group of worse performers (i.e. belong to the lower tail of the firm distribution). Within tourism related sectors, firms with highest tourism exposure, such as travel agencies and hotels are always among the best performers in terms of survival. Moreover, despite of Tourism being one of the most volatile sectors in periods of high uncertainty, results show a higher survival resilience among established tourism associated firms.

I. Introduction

In 2019 the World Travel and Tourism Council estimated that the total contribution of Travel and Toursim to world GDP and employment corresponded to 10.4% (USD 8,811.0bn) and 10.0% (318,811,000 jobs), respectively (WTTC 2018b). Tourism related GDP grew 3.5% between 2018 and 2019, one percentage point above overall GDP growth. This highlights the worldwide importance of this sector. Portugal is no exception. The tourism sector has an important weight on the country's economic performance. In 2019, the total contribution of tourism corresponded to 17.1% of GDP and 20.7% of total employment (1,003,700 jobs); WTTC (2018a).

The worldwide growth of tourist flows and tourism demand in Portugal contributed to the growing number of new tourism firms in Portugal.[1] The growth of the number of new tourism related firms makes the analysis of their life cycle and determinants of their survival an important research question. Hence, our article focuses on the understanding of the survival of tourism related firms and on how these compare to firms in other activity sectors. Using the European Community's NACE Rev.2 classification, we categorize firms into three main sectors: Manufacturing, Total Tourism and Other Services.[2] For a more detailed analysis, we further divide Total Tourism into Mainly Tourism and Partly Tourism. The former group includes firms whose activities are offered mostly to tourists, such as travel agencies and hotels; and the latter includes firms which also provide services to natives, but whose business activity is significantly influenced by tourism flows, such as restaurants, bars and transports. Interestingly, we observe that the number of active firms in the Mainly Tourism group more than doubled between 2005 and 2017, which corresponds to the period of our analysis.

Firm survival has long been recognized as a central dimension of post-entry performance. Consequently, the literature has studied which factors are most closely related with the early exit of firms across a different set of countries, sectors and time horizons.[3] More recently, a rapidly growing literature has been dedicated to study survival particularly for firms in Tourism sectors. Most of this research has focused on the survival of particular types of firms and industries, exploring characteristics which are very specific to those firms or markets, and which bear no cross-industry

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[1]See Caires, Reis, and Rodrigues (2019) for an additional description.
[2]Other Services excludes all tourism related activities (Total Tourism).
[3]For detailed reviews, see e.g. Santarelli and Vivarelli (2007); Vivarelli (2013), and Quatraro and Vivarelli (2015).

information. Yet, despite widespread recognition that survival is a key performance metric, and a growing body of studies aimed at studying survival both for firms in general and particularly those in tourism sectors, no research has aimed to study how common factors impact firm survival differently in Tourism sectors when compared to firms in general. Additionally, little is known about the heterogeneity of survival across different activities within Tourism, and the scarce existing evidence suggests that Tourism specialization does not affect survival or efficiency of accommodation firms in any clear-cut way (Fan et al. 2023; Zhang et al. 2020).

In this article, we aim to fill this gap. We study cross-industry differences in exit determinants, and compare the survival of firms according to their different exposure to tourism. Since our main goal is to explore how common factors have different impacts on survival across sectors and within Tourism industries, we focus on financial characteristics of firms, a set of variables known to be key survival determinants both for firms in general (Zingales 1998; Fotopoulos and Louri 2000; Tsoukas 2011), and those in tourism (Gu and Gao 2000; Youn and Gu 2010; Li and Sun 2012; Li et al. 2013; Park and Hancer 2012; Vivel-Búa, Lado-Sestayo, and Otero-González 2019a). For this purpose, we rely on a duration model, a class of models particularly suited to study factors impacting time-to-event, and widely established in the survival literature. While recent methodological contributions focus on improving failure predictions, particularly in Tourism sectors (Park and Hancer 2012; Li and Sun 2012; Li et al. 2013, 2017, 2019), our focus is to study the differential impact of financial characteristics on survival across sectors, and less on improving failure prediction accuracy.

The contribution of this article is threefold. First, our analysis contributes to the understanding of firm dynamics in the tourism sector, a sector which has experienced significant and steady growth over the last decades, and which plays a prominent role in the Portuguese economy. Second, available literature has mainly focused on explaining different survival dynamics within the Tourism sector, i.e. most literature has focused on very specific types of firms and industries, exploring specific characteristics to those firms bearing

no cross-industry analysis. We attempt to understand cross-industry differences, comparing the survival of firms according to their exposure to tourism. In particular, focusing on the financial health of firms we explain how the survival of firms operating in Tourism related sectors differs from that of other sectors. Third, we situate our contribution within a growing literature on firm survival in the Tourism sector by using a discrete-time hazard model, which accounts explicitly for the grouped nature of data, and allows to explicitly accommodate additional covariates in the analysis.

Our analysis reveals four noteworthy patterns. First, tourism firms have, on average, a higher frequency of exiting the market than manufacturing and other services firms over the first ten years of existence, but this frequency is lower when firms with more than ten years are considered. Second, the differences in survival between tourism related firms and firms in other sectors are larger in the left than in the right tail of the firm distribution. Third, within Total Tourism, the probability of survival is always higher for the best performing firms in Mainly Tourism activities, but for the worse performing ones, it is only higher for the first ten years in the market. Finally, firm dynamics in terms of survival is similar between Transport and Restaurants, but different from other tourism activities, presenting not only a higher likelihood of exiting the market, but also a clear decreasing pattern throughout the life-cycle of the firm. With such heterogeneity, a unified theory to explain survival in the tourism sector is unlikely to hold. Throughout the article, we present some suggestive, but not final, theories for the patterns observed in terms of survival for the different tourism activities.

II. Survival related literature

Cross-Sectoral firm survival

Theoretical work on the selection of firms and industry dynamics has long argued that firm exit decreases with age and experience (Jovanovic 1982; Hopenhayn 1992). In addition, firms' financial health is known to be intimately related to their survival. Cooley and Quadrini (2001) introduce financial constraints into a model of firm

dynamics, highlighting that smaller and financially constrained firms are more prone to exit the market. Albuquerque and Hopenhayn (2004) and Clementi and Hopenhayn (2006) model contracts where borrowing constraints are influenced by collateral value. The models highlight the importance of capital structure and collateral, predicting that firms with higher debt levels have lower likelihood of staying in the market, higher revenues are associated with lower probability of exit, and survival is increasing with firm age.

There is considerable empirical evidence to support these predictions, including in Portugal. The works of Santarelli and Vivarelli (2007), Vivarelli (2013) and Quatraro and Vivarelli (2015) provide excellent surveys of the established survival determinants across contexts and time periods. Table 1 summarizes relevant contributions and the identified survival determinants.[4] Among those promoting survival, we highlight age (Mata and Portugal 1994; Fotopoulos and Louri 2000; Bridges and Guariglia 2008), size (Mata, Portugal, and Guimarães 1995; Mata and Portugal 2002), entrepreneurial and workers' skills and experience (Geroski, Mata, and Portugal 2010; Baptista, Lima, and Preto 2012, 2013) and propensity to innovate. Market and competition characteristics, such as market concentration, entry, growth, or economies of scale (Mata and Portugal 1994; Mata, Portugal, and Guimarães 1995; Mata and Portugal 2002; Mata and Freitas 2012), and location factors such as location in capital cities or entrepreneur location experience are also key for firm survival (Mata and Portugal 2002; Fotopoulos and Louri 2000).

Measures of financial health have also been shown to be determinants of survival, for example higher profitability (Fotopoulos and Louri 2000), market capitalization (Tsoukas 2011), debt (Zingales 1998; Farinha and Santos 2006; Bridges and Guariglia 2008; Mata and Freitas 2012) or lower wages and benefits as share of operating expenses (Zingales 1998). Credit and financial constraints decrease survival prospects (Becchetti and Trovato 2002; Mata, Antunes, and Portugal 2010).

Survival in Tourism

The literature on the survival of firms in the hospitality sector has received significant attention over the last years, focusing on three important lines of research.

A first line focuses on expanding and improving the methods to predict firm failure in the hospitality industry (Park and Hancer 2012; Li and Sun 2012; Li et al. 2013, 2017, 2019), and the use of survival models is widely adopted (Gokovali, Bahar, and Kozak 2007; Kaniovski, Peneder, and Smeral 2008; Thrane 2012; Türkcan and Erkuş-Öztürk 2019; Leoni 2020; Li et al. 2022). Table 2 provides a summary of important determinants for survival in Tourism industries which have been identified using survival models. To the best of our knowledge, complementary log-log models to explicitly account for the grouped nature of failure events have to date been barely used in the hospitality sector (Fan et al. 2023 is an exception).

A second line of research highlights the importance of external and location factors for firm survival in the hospitality industry, including occupancy rates, average profitability, competition, seasonality, market share, availability of transports, or market volume (Kaniovski, Peneder, and Smeral 2008; Lado-Sestayo, Vivel-Búa, and Otero-González 2016; Falk and Hagsten 2018; Gémar, Soler, and Guzman-Parra 2019; Vivel-Búa, Lado-Sestayo, and Otero-González 2019a; Leoni 2020). While Lado-Sestayo, Vivel-Búa, and Otero-González (2016), Zhang et al. (2020), and Fan et al. (2023) analyse tourism specialization of destinations as potential determinant of survival, finding mixed effects[5], to the best of our knowledge no other attempt has been made to study the impact of different degrees of exposure to tourism. We fill this gap by using a tourism exposure measure not only at location but at the firm level, studying how different degrees of tourism exposure affect survival.

Finally, a third line of research is concerned with identifying the determinants of survival within each particular hospitality industry, including

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[4]Appendix A lists the relevant contributions for each survival determinant highlighted in those surveys.
[5]Lado-Sestayo, Vivel-Búa, and Otero-González (2016) find touristic destinations to be important for survival, Fan et al. (2023) find no systematic effect on survival of P2P accommodation listings, with tourism specialization influencing (positively) the survival of shared but not non-shared listings. Zhang et al. (2020) show that destination tourism specialization does not necessarily promote hotel efficiency, but enhances the detrimental effects of competition.

Table 1. Summary review: Main factors affecting survival.

Authors	Sectors	Context	Factors (sign on survival)
Cross-Sectoral			
Zingales (1998)	Trucking	US, ICC filings 1976–1985	Net debt to capital (−); return on sales (+); return on assets (+);
			Revenues (+); intangibles (./-); wages and benefits/operating expenses (−).
Fotopoulos and Louri (2000)	Manufacturing	Greece, 1982–1992	Size (+); growth; profitability as return on assets (+);
			Liabilities to assets as leverage (−); fixed to total assets as capital (+); contestability (+);
			Capital location (+); age(+).
Mata and Portugal (2002)	Cross-Sectoral	Portugal, 1983–1990	Share of college graduate workers (+); Size (+); Limited liability (+);
			Nr of plants (.); Concentration (+/.); Economies of scale (−);
			Entry (−); Foreign ownership (.).
Bridges and Guariglia (2008)	Cross-Sectoral	UK, 1997–2002	Age (+); size (+); profitability as profits before interest and tax to assets(./-);
			Group (+); leverage as short term debt to assets (−); collateral as fixed to total assets(+);
			Global engagement interacted with financial variables (smaller or null impact of financial variables).
Tsoukas (2011)	Cross-Sectoral	Indonesia, Korea, Malaysia,	Leverage as debt to assets (−); profitability as profits before interest and taxes to assets (+);
		Singapore and Thailand,	Collateral as fixed to total assets(+); duration in the stock exchange (and squared) (+, decreasing);
		1995–2007	Market capitalisation to GDP (+); market value traded to GDP(+);
			Private bank credit to gdp (−); deposit-money bank domestic assets to GDP (−).
Santarelli and Vivarelli (2007)			Start-up size (+); age (+); credit constraints (−);
Vivarelli (2013)	Cross-Sectoral	Literature Survey	Lack of fiancial capital (−); managerial education and human capital (+);
Quatraro and Vivarelli (2015)		Focused on new firms	Entrepeneur industry-specific experience (+); entrepeneur location experience (+);
& references therein[1]			Innovation propensity (+).

Review of important and recent studies using survival models and main survival-impacting factors identified. (+) indicates positive impact on survival; (−) negative impact on survival; and (.) no impact on survival.

[1]For a detailed list of references associated with each survival factor, please refer to the Appendix A

hotels (Lado-Sestayo, Vivel-Búa, and Otero-González 2016; Vivel-Búa, Lado-Sestayo, and Otero-González 2019a; Lin and Kim 2020; Yuan et al. 2023), resort hotels (Gémar, Soler, and Guzman-Parra 2019), exhibitions (He, Lin, and Li 2020), restaurants (Chen et al. 2022; Li et al. 2023, 2022), P2P accommodations (Leoni 2020; Fan et al. 2023) and multi-business hospitality firms (Li et al. 2019). Some of the recent findings in activity-specific determinants of survival include the effect of the degree and inconsistency of media coverage and internet reviews (Leoni 2020; Li et al. 2022; Yuan et al. 2023; Li et al. 2023), geographic and brand diversification (Lin and Kim 2020), relationships to trade association and industry clusters (He, Lin, and Li 2020), or the relationship between firm misconduct, peer misconduct and survival (Chen et al. 2022).

The importance of the general determinants of survival, reviewed in previous section, has not been overlooked, including size (Kaniovski, Peneder, and Smeral 2008; Lado-Sestayo, Vivel-

Búa, and Otero-González 2016; Falk and Hagsten 2018; Vivel-Búa, Lado-Sestayo, and Otero-González 2019a), age (Lin and Kim 2020; He, Lin, and Li 2020), or management related factors (Brouder and Eriksson 2013; Mehraliyev 2014; Gémar, Moniche, and Morales 2016, 2019; Li et al. 2019; Leoni 2020). Financial conditions have also been shown to be important for the survival of Tourism industries, including profitability, debt, liquidity, cash-flow, or tangible to total assets (Gu and Gao 2000; Youn and Gu 2010; Li et al. 2013; Lado-Sestayo, Vivel-Búa, and Otero-González 2016; Gémar, Moniche, and Morales 2016; Li, Xu, and Yu 2017; Gémar, Soler, and Guzman-Parra 2019; Vivel-Búa, Lado-Sestayo, and Otero-González 2019a; Li et al. 2019). While these characteristics have been shown to matter for survival of firms in general and those in Tourism in particular, no study has focused on how their impact may change with Tourism exposure. As such, intriguing patterns have been left unaddressed. For example, while

Table 2. Summary Review: Main factors affecting survival in tourism and hospitality related sectors.

Authors	Sectors	Context	Factors (sign on survival)
Hospitality & Tourism			
Lado-Sestayo et al (2016)	Hotel Firms	Spain, 2011-2015	**hotel characteristics**: operating income/total assets (+); equity/current liabilities (+); cash flow/total assets (+); size (+); current to total assets (-); liabilities / assets (-). **location factors**: occupancy rate (+); average profitability (+); competition (+).
Falk and Hagsten 2018	Accommodation Establishments	Sweden, 2002-2012	widespread access to broadband infrastructure (+); local competition (u shape); seasonal concentration of operations (-); size (+); age (.); average revenue per overnight stay (+).
Gémar et al. (2019)	Resort Hotels	Spain, 1997-2009	size (./+); tourism location (+); opening during economic boom (+); **management factors**: employee cost to operating revenue (-); profit margin (+); **financial structures**: working capital to equity (.); return on assets (.).
Vivel-Búa et al. (2019a)	Hotels (micro, small, medium)	Spain, 2007-2015	**firm factors**: net income/total assets (+); cash flow/total sales (+); net sales revenue/total assets (+); total liabilities / total assets (-); **external factors**: seasonality (+, for micro); occupancy rate (+, for small and medium), market share (+, micro and small).
Leoni (2020)	Peer-to-Peer Marketplaces	Ibiza, 2015-2016	entire property (+); private room (+); distance to the beach (-); age (+); minimum stays (+); online reputation (+); **host factors**: experience (+); number of listings (+); **market factors**: concentration (-); competition (-).
He et al. (2020)	Exhibitions	China, 1981-2019	exhibition history (+); start-up size (+); trade association connection (+); relevant industry clusters (+); public transportation (+); location in first-tier cities (+); industry-factors as machinery vs automobile (+)
Lin and Kim 2020	Hotels	Texas, 2000-2018	geographic diversification (-); segment diversification (-); brand diversification (+); franchised hotels: geographic divers (.); brand divers (+); segment divers (-). company-owned hotels: geographic divers (-); segment divers (-); brand divers (.).
Chen et al. (2022)	Restaurants	Firms in Shanghai, 2011-2019	own misconduct (+, decreasing in identifiability and familiarity, increases peer misconduct); peer misconduct (-); familiarity and identifiability as news coverage and trademarks shield against peer misconduct.
Li et al. (2022)	Restaurants	Shanghai, 2011-2019	total number of news articles (+): app news (+), website news (+), news w/ topic operations (+), news w/topic product (./+); Inconsistent coverage (-, but + if total volume large enough).
Fan et al. (2023)	Peer-to-Peer Marketplaces	Beijing, 2018-2020	**listing factors**: entire home (- for shared listings); shared rooms (- for non-shared listings); reviews (+); **managerial quality**: longevity (+), response (+); **external factors**: transport availability (+); market volume (+); tourism specialization (., + for shared listings only).

Review of important and recent studies using survival models and main survival-impacting factors identified. (+) indicates positive impact on survival; (−) negative impact on survival; and (.) no impact on survival.

firm survival is increasing in age, Falk and Hagsten (2018) find that it does not influence survival of accommodation establishments. Gémar, Soler, and Guzman-Parra (2019) show that usual measures of size or financial structure, like the return on assets, are not as important for predicting survival of hotels, contrary to general firms. We focus on variables known to impact survival of firms in both Tourism and other sectors and investigate such patterns within a unified context, further distinguishing between different levels of tourism exposure.

III. Data and methodology

In the analysis that follows we use firm-level data covering the period between 2006 and 2017 which is drawn from *Informação Empresarial Simplificada* (IES), an administrative dataset covering the universe of Portuguese non-financial firms.[6] IES includes balance sheet and income statement information, yearly reported by firms to the Ministry of Justice, Ministry of Finance, Banco de Portugal and Statistics Portugal during tax payments. We focus on firms in Manufacturing, Tourism-associated activities, and Other Services with positive values of turnover and assets, and less than 45 years of existence in 2006. A firm is considered to die in year t if the firm reports its closure in year t, by termination of activity, dissolution, or liquidation; or reports its activity in year t but does not report for at least two consecutive years after year t.

In the context of survival, our sample combines features of a population sample, an inflow sample and a stock sample (Jenkins 2005). Firm-level data stems from administrative records, not directly related to duration. We consider firms which were already active in 2006 (and continue

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[6]It is not unlikely that very small firms may not be totally covered as some may not have official accounting and therefore do not have the requirement to send this information. However, we believe that this potential limitation of the dataset does not compromise the main results and conclusions discussed in this article.

to be for at least one additional year) as well as firms born between 2007 and 2015.[7] Data is right-censored as the end of the duration spell is not observed, and left-truncated, or with *delayed entry*, as some firms already have ongoing spells when they are first observed. Importantly, these firms are the selection of survivors from cohorts which we incompletely observe. Left-truncation imposes that interpretation is conditional on survival until 2006, but these characteristics pose no threats to our estimation (Jenkins 1995).[8] Finally, our data is interval-censored as there is information on whether the firm was active or closed (dead) by the end of each year, but not when during the year the firm closed its activity. All these features are appropriately accounted for in the model we consider. In this article we use a complementary log-log (cloglog) model to analyse the survival patterns of firms.[9] In our analysis, duration is measured in years and thus conventional continuous time duration models are not suited for analysis. The cloglog model is typically used to deal with intrinsically continuous but grouped data (Jenkins 2005).

Group definitions by activity

We are particularly interested in accounting for differences in firm survival related to their business activity and exposure to tourism. Hence, based on the European Community's classification NACE Rev.2, we categorize firms into three distinct sectors, according to their activity: Total Tourism, Manufacturing and Other Services.[10]

In order to identify firms in sectors with larger influence of tourism we follow the definitions put forward by the Eurostat (2018). Total Tourism includes firms with activity directly or indirectly related to tourism and is divided into two subgroups: Mainly Tourism and Partly Tourism (see Table 3). The first part of our analysis compares firms in Total Tourism with firms in the Manufacturing and Other Services sectors, while the second part explores differences in the intensity of tourism exposure by separately analysing Mainly and Partly Tourism. The former group includes firms whose activities are offered mostly to tourists, such as travel agencies and hotels; and the latter includes firms which also provide services to natives, but whose business activity is significantly influenced by tourism flows, such as restaurants, bars and transports.

Table 3. Tourism activity cassification.

NACE Code	Description	Total Partly	Tourism Mainly
H491	Passenger rail transport, interurban	✓	
H4932	Taxi Operation	✓	
H4939	Other passenger land transport	✓	
H501	Sea and coastal passenger water transport	✓	
H5110	Passenger air transport		✓
I5510	Hotels and similar acco		✓
I5520	Holiday and other short-stay acco		✓
I5530	Camping grounds, recreational vehicle parks and trailer parks		✓
I5610	Restaurants and mobile food service	✓	
I5630	Beverage serving	✓	
N771	Renting and leasing of motor vehicles	✓	
N7721	Renting and leasing of recreational and sports goods	✓	
N79	Travel agency, tour operator reservation service and related		✓

Eurostat (2018) article on "Tourism Industries - economic analysis". Sector code according to NACE Rev.2.

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[7]Our sample ends in 2017, however for the survival analysis we consider only new firms up to 2015.
[8]In the context of the cloglog model (which is the approach we consider), the predicted hazard rate for a firm in period t is conditional upon survival until $t-1$ (see Appendix B for details).
[9]The log(-log(.)) is the *complementary log-log* transformation which gives name to the cloglog model.
[10]Other Services excludes all tourism related activities (Total Tourism).

Since our analysis is focused on firms which are mainly dedicated to tourism-related activities, this implies that a narrow set of firms is characterized as Mainly Tourism (between 2,700 and 3,500 firms each year). Partly Tourism considerably broadens the definition and accounts for roughly 20,000 firms per year. Around 30,000 firms are in the Manufacturing sector each year and the Other Services sector is by far the one with the largest share of firms, with circa 110,000 firms each year, which is expected, given the large heterogeneity of activities accounted for by this sector.

The Manufacturing sector includes all firms in section C of NACE Rev. 2. The Other Services sector includes firms in the Wholesale and Retail; Transportation; Accommodation and Food Services; Information and Communication; Real Estate; Professional, Scientific and Technical activities; Administrative and Support activities; and Other Service activities, excluding those included in Total Tourism (see Appendix C for a discussion on the detailed distribution of firms by activity in Mainly Tourism, Partly Tourism, and Other Services.).[11]

Failure predictors

In the proportional hazards framework, the baseline hazard is scaled by different values of covariates, variables which are important in predicting failure. In addition to being interested in how the predicted hazard of tourism-exposed firms differs from that of firms in Manufacturing and Other Services, we are also interested in understanding how the impact of such covariates on the predicted hazard and survival differs across groups of interest. We resort to the literature on (overall and tourism-related) firm survival to assess the most important factors in influencing failure (see Section II). The size of the firm, measured by the log of sales (*SALES*), the return on total assets as a proxy of profitability, defined by the percentage of operating profit in total net assets, (*ROTA*), a ratio of debt-obtained funds to total assets as a measure of firm leverage (*DEBT*), and the percentage of fixed assets in total assets as a proxy for firm collateral (*FIXED*) were included in the model.[12]

According to theoretical predictions, we expect SALES, ROTA and FIXED to negatively impact the hazard rate of firms, while DEBT is expected to increase the failure probability. The exposure to international demand and the growth of the tourism sector over the last decades in Portugal motivates our expectation for a negative impact of tourism exposure on firms' hazard rate (see Appendix D for a discussion on the main summary statistics for each sector and by sub-categories of Total tourism).

IV. Empirical analysis of firm survival

Total tourism firms survival

Results of our regression analyses comparing the three main groups of activities (Total Tourism, Manufacturing and Other Services) are displayed in Table 4, columns (1) to (6), and Figure 1. In Table 4, we provide the results for the conventional cloglog model and report for each sector a specification with a linear and a quadratic term on age, and another with a cubic term as well.

The results indicate that the four covariates used in the model and discussed in section 3.2 are important for the different sectors. In particular, *SALES*, *ROTA* and *FIXED* have a negative impact on the probability of exit while *DEBT* is positively associated. Nevertheless, while the impact of *ROTA* and *DEBT* is similar among sectors, the negative impact of *SALES* and *FIXED* is around half in Tourism firms when compared to firms in Manufacturing and Other Services. This evidence is in line with the idea that size (as measured by *SALES*) and economies of scale are less important for services, particularly in hospitality and tourism sectors (Gémar, Soler, and Guzman-Parra 2019). We not only corroborate that they are less important for hospitality services, but show that the effect of size is actually analogous for other services and manufacturing, once tourism exposure is taken into account. The role of both *SALES* and *FIXED* seems to hide important heterogeneity within Tourism sectors according to exposure intensity, which we discuss in the next section.

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[11]Other Services correspond to sections G, H, I, J, L, M, N and S of NACE REV 2 excluding those included in Total Tourism (see Table 3 for Eurostat's Tourism Industries definitions).

[12]Firms with incomplete information were excluded. Key variables were trimmed at the 99th percentile to limit the influence of outliers.

Table 4. Cloglog hazard - Different samples.

	Manufacturing		Services		Total Tourism		Mainly Tourism		Partly Tourism	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
const	-0.988***	-0.969***	-1.117***	-1.122***	-1.296***	-1.250***	-1.702***	-1.750***	-1.225***	-1.175***
	(0.049)	(0.050)	(0.021)	(0.021)	(0.044)	(0.045)	(0.146)	(0.147)	(0.047)	(0.048)
AGE	-0.026***	-0.034***	-0.027***	-0.025***	-0.062***	-0.086***	-0.015*	0.004	-0.065***	-0.092***
	(0.002)	(0.004)	(0.001)	(0.002)	(0.002)	(0.004)	(0.006)	(0.014)	(0.002)	(0.004)
AGE^2	0.000***	0.001***	0.000***	0.000*	0.001***	0.002***	0.000	-0.001	0.001***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
AGE^3	-	-0.000*	-	0.000	-	-0.000***	-	0.000	-	-0.000***
		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)
SALES	-0.116***	-0.114***	-0.112***	-0.113***	-0.070***	-0.063***	-0.072***	-0.076***	-0.075***	-0.067***
	(0.004)	(0.004)	(0.002)	(0.002)	(0.004)	(0.004)	(0.010)	(0.011)	(0.004)	(0.004)
ROTA	-0.014***	-0.014***	-0.012***	-0.012***	-0.011***	-0.011***	-0.011***	-0.011***	-0.011***	-0.011***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
DEBT	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.001	0.001	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
FIXED	-0.008***	-0.008***	-0.006***	-0.006***	-0.004***	-0.004***	-0.012***	-0.012***	-0.003***	-0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
Obs	252413	252413	981325	981325	205856	205856	26511	26511	179345	179345

Robust standard errors in parentheses. Significance levels: 1%*** 5%** 10%*. AGE^k, $k = 2, 3$, refers to AGE squared and cubed. All specifications include year fixed effects.
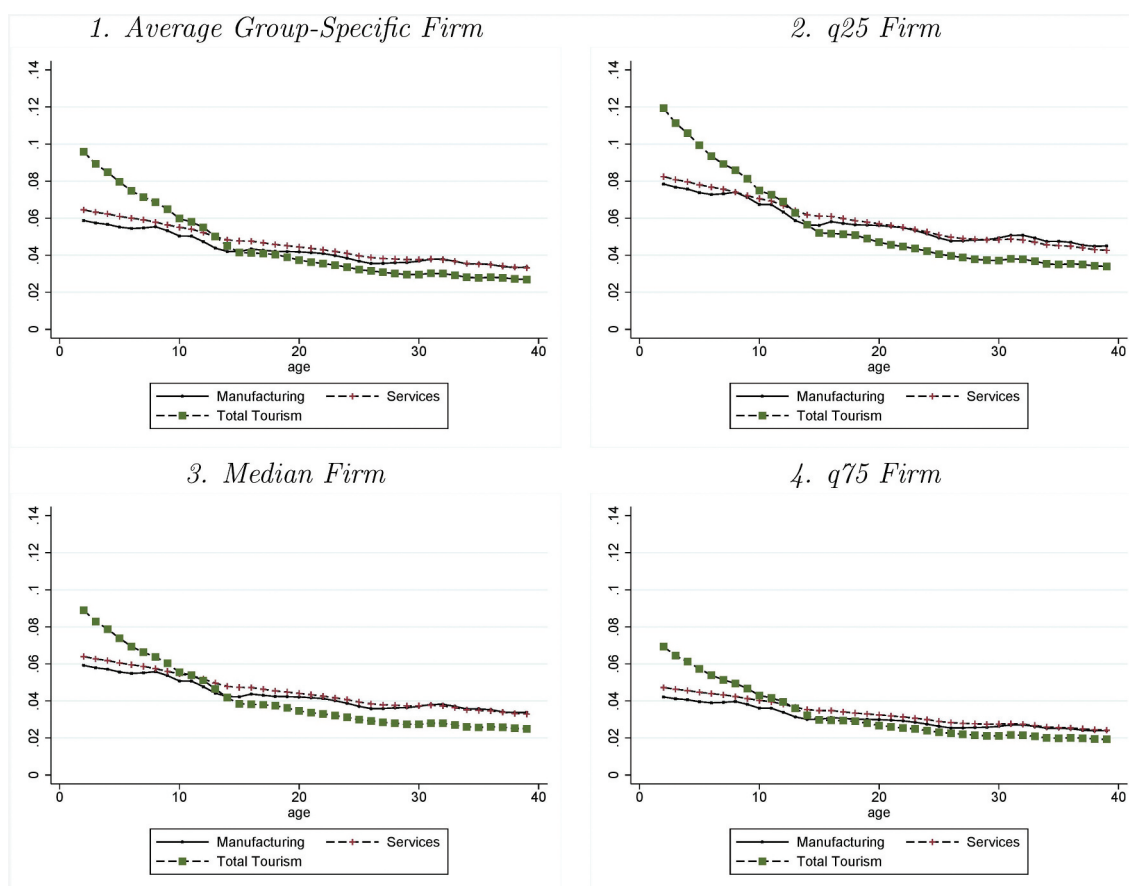
Figure 1. Predicted hazard rates. Manufacturing, Total Tourism and Other Sectors
Notes: Panel 1 represents the predicted hazard for each group-specific average firm (average firm for models (2), (4) and (6) of Table 4). Panels 2 to 4 represent the predicted hazard using the models in Table 4 using the values for the within-group q25, median and q75 of each covariate. As debt positively influences hazard, when remaining covariates were set to q25 it was set to q75, and when the remaining covariates were set to q75, it was set to q25.

We confirm, within a unified framework, that the likelihood of continuing in the market depends on the financial situation of firms in Tourism (Lado-Sestayo, Vivel-Búa, and Otero-González 2016; Vivel-Búa, Lado-Sestayo, and Otero-González 2019a; Gémar, Soler, and Guzman-Parra 2019) and other industries (Zingales 1998; Fotopoulos and Louri 2000; Tsoukas 2011). Companies with larger size (SALES), higher profitability (ROTA), higher collateral (FIXED) and with lower leverage (DEBT) have a lower probability of exit. This first set of results leads to the idea that the dynamics of an average firm in terms of survival in the tourism sector is not that different from the dynamics of an average firm from Other Services or Manufacturing.

In terms of firm's age, for the three sectors considered, the linear term is negative and the squared term positive. The only difference between sectors is the magnitude of the coefficients. For instance, for Total Tourism, in absolute value, these are around two times the values for the other sectors. Firm survival has been shown to be intimately linked with age (Mata and Portugal 2002; Fackler, Schnabel, and Wagner 2013). Our results confirm this relationship also for the Tourism sector in Portugal. When we allow for the possibility of a cubic term, the evidence is mixed: for Other Services the term is positive but non-significant, for Manufacturing it is negative and marginally significant while for Total Tourism it is negative and significant.

Figure 1 presents the hazards for the average firm in each of the three sectors to exit (panel 1). In addition, in panels 2 to 4, we also analyse the hazard for firms at different points of the distribution (e.g. median firm (quantile 50), and firms at the 25th and 75th quantiles in terms of covariates). In particular, we present the predicted hazard rates, taking into account the firms in the 25th, 50th and 75th quantiles (which we define as q25, q50, q75, respectively), of

each covariate (SALES, ROTA, FIXED and DEBT), in panels 2 to 4, respectively. The results in Figure 1 consider the impact of the determinants of survival on the hazard rates.

The observed patterns are identical for Manufacturing and Other Services, but display some difference when compared to Total Tourism. Consistent with previous findings (Mata and Portugal 1994; Fackler, Schnabel, and Wagner 2013; Yasuda 2005), the hazard is decreasing in all sectors, but smoother in the case of Manufacturing and Other Services. In fact, in the first years the hazards of the average firm in the Tourism sector is clearly above the ones presented by the other sectors but drops considerably until age 15 where the hazard of mature tourism firms becomes smaller than in the other sectors. Then the hazard rates decrease slowly and present a similar pattern in all sectors.

Tourism firms, are on average, less likely to survive when compared to Manufacturing and Other Services firms in the first 10 years of existence. In contrast, for firms with more than 10 years, the likelihood to exit is lower among those in the Tourism sector. Overall, results for the 25th, 50th and 75th quantiles provide a similar insight in terms of the evolution of the hazard. The main difference is in terms of magnitude, and particularly in the first 5 to 10 years, where firms presenting worse indicators are more likely to exit and display a bigger difference between Tourism and other sectors. Despite the similar evolution, firms with better financial indicators in the Tourism sector are less vulnerable to early exit and possibly mature faster, with survival profiles that mimic closer those of firms in the other sectors. Hence, differences are larger in the left tail than in the right tail of the firm distribution.

Mainly tourism versus partly tourism

In this section, we compare the two main group of activities within the Total Tourism as described in the previous section: Mainly Tourism and Partly Tourism.

Columns (7)--(10) in Table 4 display the results for the two groups. Firm size (SALES), profitability (ROTA) and collateral (FIXED) are important determinants of the likelihood of exiting the market in both sectors but leverage is only significant for firms in the Partly Tourism activities. The negative impact of firm size and profitability is similar between sectors, but the negative impact of the collateral variable is almost four times higher for the Mainly Tourism activities. These findings can be justified by higher collateral limiting the credit constraints of Mainly Tourism accommodation firms (Goedhuys and Sleuwaegen 2010), and could be interpreted in light of the idea that entrepreneurial plans may reduce the impact of borrowing constraints for survival, particularly once the role of collateral is taken into account (Santarelli and Vivarelli 2007; Vivarelli 2013; and references therein). Better management skills, in particular entrepreneurial saving plans and higher collateral, in the form of physical infrastructure, make Mainly Tourism firms better able to manage the impact of leverage on survival.

Interestingly, the evidence on the association between firm age and the likelihood of exiting the market is different between the two groups. For Partly Tourism, all terms (linear, quadratic and cubic (when used)) in both specifications are significant. In contrast, for the Mainly Tourism firms we do not observe significant differences by age. The only significant term is the linear term but it is only marginally significant. The insignificance of a firm's age in Mainly Tourism seems to be in contrast to the survival literature, which finds that younger firms are more likely to fail. However, these findings are consistent with those of Falk and Hagsten (2018) and Falk (2013), who find age not to be an important driver of survival in saturated mature industries. In our setting, the most prevalent category in Mainly Tourism are hotels, on average older and well established firms, for whom the role of age is no longer decisive. On the other hand, the impact of age is stronger for Partly Tourism than any other sector. This can be explained by the importance of establishing reputation, media coverage and familiarity with loyal customer base for firms in those sectors (Chen et al. 2022; Li et al. 2022, 2023), like Restaurants and Bars, a process that takes time. We investigate this hypothesis in the next section. Overall, the impact of age maybe non-linear in tourism exposure, possibly because of maturity levels of the industry. Stronger for firms in tourism than for those in general, but this hides heterogeneity. High exposure to tourism is associated with lower impact of age. In our case, mostly driven by hotels, an industry possibly at a higher stage of maturity. Other sectors with partial exposure to tourism, like restaurants, suffer higher hazard rates when young and trying to establish themselves.
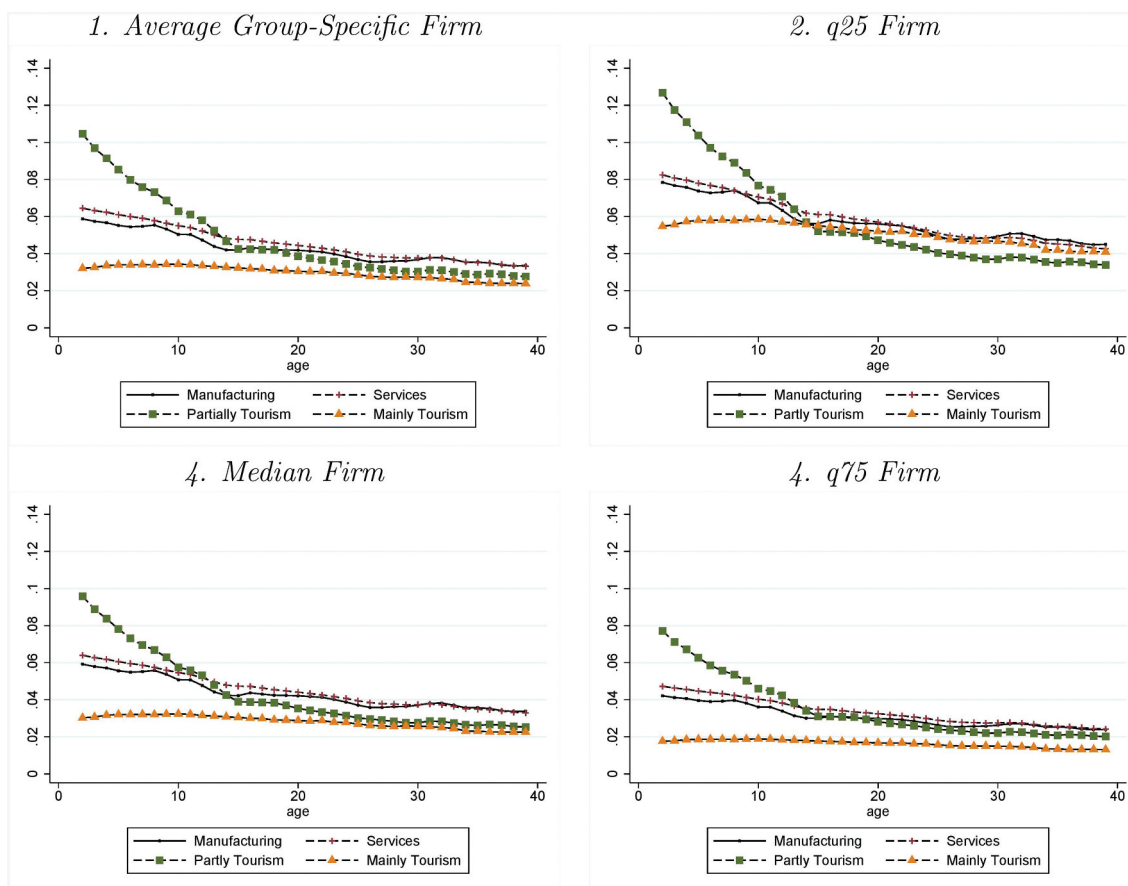
Figure 2. Predicted hazard rates. Manufacturing, Partly Tourism, Mainly Tourism and Other Services.
Notes: Panel 1 represents the predicted hazard for each group-specific average firm (average firm for models (2), (4), (8) and (10) of Table 4). Panels 2 to 4 represent the predicted hazard using the models in Table 4, using values for the within-group q25, median and q75 of each covariate. As debt positively influences hazard, when remaining covariates were set to q25 it was set to q75, and when the remaining covariates were set to q75, it was set to q25.

Therefore, in Figure 2, the observed patterns are not identical for the two sectors. In general, it is observed that the odds of not surviving is smaller in Mainly Tourism than in Partly Tourism. The hazard clearly decreases for the Partly Tourism firms, while the hazards for the Mainly Tourism firms are relatively constant over time. On average, the hazard rates of the Partly Tourism firms are always above the Mainly tourism firms. However, when the firms are older (between 30 and 40 years) the difference is less than 1% point, and the hazard rate in both sectors is close to 3%. In contrast, in the first couple of years the hazard rate for a firm in the Partly Tourism sector is around 10% while in the Mainly Tourism sector it is below 4%. Finally, the likelihood of exit among Mainly Tourism firms is always lower than the one presented by firms in Manufacturing and Other Services.

Looking at firms with different indicators it is interesting to observe that for firms with lower sales, lower profitability, lower collateral and higher debt the hazards for firms from the Partly Tourism after age 15 turn out to be lower than the ones in the Mainly Tourism sector. In fact, the probability of exit goes from 13% in the first year to 4% at age 40, while this rate is around 5% and relatively constant for firms in Mainly Tourism. This result shows that the worse performers in the Mainly Tourism group are more vulnerable firms than similar firms in the Partly Tourism sector after 10/15 years in the market.

This phenomenon is not observed for firms with the best indicators where the probability of exit is always around 2%, in contrast to the ones in Partly Tourism where the probability goes from 8% to 3%. Thus, a firm in the Mainly Tourism sector that presents higher sales, higher profitability, higher collateral and lower debt is more likely to survive than firms in the same part of the distribution in the Partly Tourism sector.

Hence, the likelihood of not exiting the market is always higher for the best performing firms in Mainly Tourism, but for the worse performing in this sector the likelihood of survival is only higher during the first 10 years in the market.

Differences by industries offering services to tourists

Results of our regression analysis by individual activities within the tourism sector are displayed in Table 5 and Figure 3. As before, we use the conventional cloglog model but report only results from the specification using the linear, quadratic and cubic term on firm age.

The determinants of the different activities of exiting the market are, indeed, different. First, leverage is only relevant to Restaurants, only marginally significant to Bars and Travel agencies but not important to the other activities (Transports, Hotels and Other Accommodation). In what concerns the other variable, sales and profitability are relevant to all activities except Other Accommodation, for which it is only marginally significant, and collateral is important for all activities. This corroborates our previous discussion on the role of collateral in Hotels limiting the harm of leverage for survival, and the possible differences brought by management and entrepreneurial skills. In fact, hospitality management has become a sought-after degree in Portugal over the last years. Furthermore, in terms of magnitude, the heterogeneity of the impacts of the different determinants in the different activities should be highlighted, in particular, the higher sensitivity of firms belonging to the transport sector regarding sales. For instance, for an increase of 1 standard deviation of SALES, the likelihood of exiting in the transport sector is around 30%, while in Hotels, Other Accommodation and Travel Agencies it is around 20%, and less than 15% in Restaurants and Bars.

The evidence regarding the relation between age and probability of exit is different between sectors. In the Restaurants and Bars only the linear and quadratic terms are significant, in the Transport sector only the quadratic and the cubic terms are significant (but only marginally in the first case). This confirms the hypothesis that the impact of age is much stronger for Restaurants and Bars, which need time to establish reputation and build familiarity, collect customer reviews, and gather media attention, all critical for their survival according to Chen et al. (2022), and Li et al. (2022, 2023). In fact, this effect drives the larger impact of age on Tourism exposed firms, when compared to other sectors.

In the remaining activities, Travel Agencies, Hotels and Other Accommodation we do not observe any term related to firm age to be significant. This again confirms that age may exert limited influence on survival in saturated industries dominated by mature firms (Falk 2013), like Hotels in Portugal. The finding that age has no impact on Other Accommodation, given the recent boom in creation and entry of short-stay accommodation firms, is also consistent with the idea that new accommodation establishments (Caires, Reis, and Rodrigues 2019) are not at a disadvantage (Falk and Hagsten 2018), but at odds with the literature for firms in general (Fackler, Schnabel, and Wagner 2013; Yasuda 2005). Longer time-horizon analysis that enable better understanding of the lifecycles of such very young firms are interesting subjects for further research.

Therefore, in Figure 3, the observed patterns are not identical between activities in terms of the hazard rates.[13] Taking into account Figure 3 we can divide activities into three groups: (i) Transports and Restaurants; (ii) Travel Agencies and (iii) Bars, Hotels and Other Accommodation.

In the first group, we observe higher hazard rates when compared to the other activities and a clear decreasing pattern (from around 12% in the first year to 8% at age 10 and close to 5% after 20 years in the market). The second group presents a stable but slightly increasing path (from below 4% in the beginning to around 5% at age 10 and 20) and in the last group the hazard rates are pretty much constant over time (around 3%).

The results suggest that firm dynamics in terms of survival is similar between Transport and Restaurants and different from other tourism activities presenting not only a higher likelihood of exiting the market but also a clear decreasing pattern throughout the lifecycle of the firm. In addition, Hotels and Other Accommodation present a similar pattern (also

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[13]The analysis is restricted to the years below 20 as some of the industries, in particular Other Accommodation, do not have enough firms after that period to perform a reliable analysis.

Table 5. Cloglog hazard - Sub-categories of total tourism.

	Transports (1)	Restaurants (2)	Bars (3)	Travel Agencies (4)	Hotels (5)	Other Accom. (6)
const	−0.790***	−0.838***	−0.700***	−1.983***	−1.344***	−1.763***
	(0.146)	(0.066)	(0.075)	(0.280)	(0.211)	(0.359)
AGE	0.018	−0.070***	−0.071***	0.037	−0.030	0.075
	(0.017)	(0.006)	(0.007)	(0.025)	(0.019)	(0.049)
AGE^2	−0.001*	0.001***	0.001***	−0.002	0.001	−0.003
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)
AGE^3	0.000**	−0.000	−0.000	0.000*	−0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SALES	−0.255***	−0.079***	−0.099***	−0.071***	−0.108***	−0.080*
	(0.018)	(0.005)	(0.006)	(0.021)	(0.016)	(0.031)
ROTA	−0.007***	−0.010***	−0.009***	−0.013***	−0.012***	−0.005*
	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)
DEBT	0.002	0.002**	0.001*	0.006*	−0.002	0.003
	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)	(0.003)
FIXED	−0.008***	−0.005***	−0.003***	−0.010***	−0.011***	−0.014***
	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)	(0.003)
Obs	53321	67956	54039	7077	14204	4571

Robust standard errors in parentheses. Significance levels: 1%*** 5%** 10%*. AGE^k, $k = 2, 3$, refers to AGE squared and cubed. All specifications include year fixed effects.
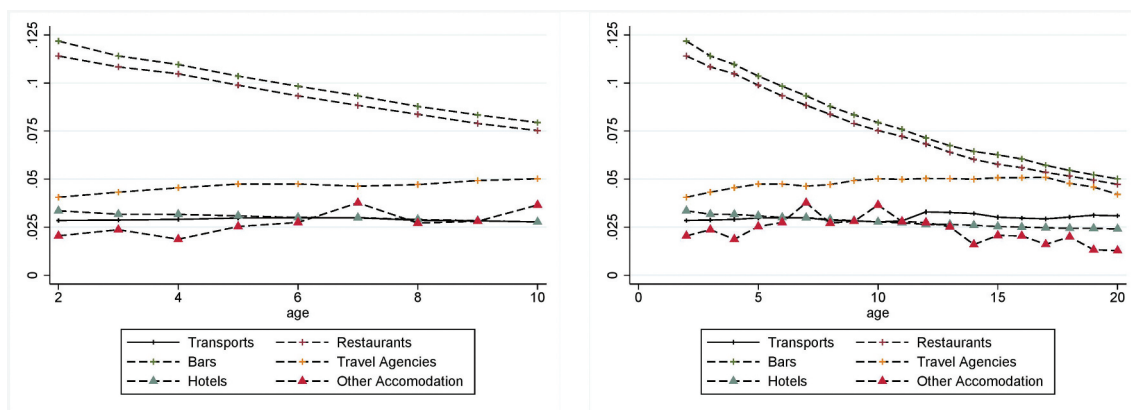
Figure 3. Predicted hazard rates - Sub-categories of total tourism. Notes: These figures plot the predicted hazard of each group-specific average firm (average firm for models (1) to (6) of Table 5). Panel 1 displays 10 years of life, Panel 2 displays 20.

similar to Bars) presenting the lower hazard rates in the sector and a relatively stable pattern overtime. Travel Agencies are between these two groups in terms of survival but present a slightly increasing trend.

V. Concluding remarks

In our analysis, we observe that the likelihood of a firm in the Tourism sector surviving depends on its financial strength, as firms with larger size, profitability, and lower leverage have more chances of not exiting the market. This result is in accordance with existing literature. The results further suggest that the determinants of firm survival are similar in the three sectors considered. However, in terms of firms' survival dynamics, the likelihood of survival during the first ten years of existence, is on average, always higher in Manufacturing and Other Services than in Total Tourism. In contrast, for firms with more than 10 years, the likelihood to exit is lower in Total Tourism.

Within the Tourism sector's related activities, the likelihood of continuing in the market is always higher for the best firms in Mainly Tourism, but for the worse performing firms in this sector, the survival is only higher in the first 10 years of existence. Furthermore, within the tourism sector, there is clear evidence of heterogeneity. In terms of hazard rates, Transports and Restaurants observe a higher hazard when compared to the other activities but with a clear decreasing pattern.

Overall, firms associated with tourism activities, conditional on surviving more than ten years, are more resilient when compared to firms operating in Manufacturing or Other Services. Despite of being one of the most volatile sectors in periods of high uncertainty, results show a higher survival resilience among established tourism associated firms.

The strength and aim of this article is to provide an empirical contribution to the field, in particular enhancing the heterogeneity pattern within the tourism sector. From our work it seems clear that a unified theory to explain survival for the tourism sector can be ruled out. Instead, our results present clearly an heterogeneity pattern within the tourism activities, in particular through tourism exposure. In this scenario, we present some suggestive theories for the different type of activities, that clearly need further research for the literature to be able to provide a more robust perspective on the theory behind tourism industries.

Some potential limitations open interesting avenues for future research. For example, due to the non-availability of information, this research is silent about the role of managerial ability, including experience, skills and best practices. Entrepreneur characteristics are important predictors of survival across sectors, including in Tourism. However, no research has aimed at understanding how managerial skills interact with Tourism exposure to predict firm survival, nor the relative importance of particular dimensions of entrepreneurial ability in Tourism and other sectors. Such research would be valuable to

inform policies on sector dependent qualification programs, such as tourism management degrees, and help tailoring executive education.

Additionally, while this article accounts for aggregate common economic shocks, we do not analyse local economic conditions, which could entail differences in the relative importance of the factors we study. Location and local market characteristics, like capital location and competition, have been associated with the survival of new firms in general and those in Tourism sectors (Fotopoulos and Louri 2000; Mata and Portugal 2002; Leoni 2020). Others, like seasonality, transport availability and relevant industry clusters, have been shown to be associated with survival in hospitality businesses (Vivel-Búa, Lado-Sestayo, and Otero-González 2019b; He, Lin, and Li 2020; Fan et al. 2023). Nevertheless, no research has yet focused on understanding the interplay between these environmental factors and Tourism in affecting survival, nor how regional business cycles affect survival differently according to Tourism exposure. Such research would be crucial for a wide range of policy areas: transport and infrastructure, competition and location- as well as sector-dependent incentives to entrepreneurship.

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Appendix
Survival of the fttest: Tourism Exposure and Firm Survival

A - Additional References

The works of Santarelli and Vivarelli (2007), Vivarelli (2013), and Quatraro and Vivarelli (2015) have guided our literature review on the well established determinants of new firm survival, which we have highlighted in Table 1. In this section, we extend the literature review on determinants of survival to acknowledge the references therein. They complement the ones we refer to in the main text. Among the most important determinants of survival, they highlight:

- **Age**: Yasuda (2005); Calvo, 2006; Fackler, Schnabel, and Wagner (2013);
- **Size**: Audretsch and Mahmood, 1995; Mata, Portugal, and Guimarães (1995); Agarwal and Audretsch, 2001
- **Entrepeneurial education and human capital**: Bates, 1990; Gimeno et al, 1997; Acs et al., 2007; Geroski, Mata, and Portugal (2010)
- Parker, 1997; Barr, 1998; Dahl and Sorenson, 2012; Baptista, Lima, and Preto (2012), 2013
- **Propensity to innovate**: Esteve-Perez et al., 2004; Raspe and van Oort, 2011; Cefis and Marsili, 2005, 2006; Colombelli et al., 2014
- **Credit and Financial Constraints**: Becchetti and Trovato (2002); Carpenter and Petersen, 2002; Aghion et al., 2007; Goedhuys and Sleuwaegen (2010)

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B - The Discrete Time Proportional Hazards Model

In this paper, we use a complementary log-log (cloglog) model to analyse the survival patterns of firms.[14] In our analysis, duration is measured in years and thus conventional continuous time duration models are not suited for analysis. The cloglog model is typically used to deal with intrinsically continuous but grouped data (Jenkins 2005).

The hazard rate function corresponds to the likelihood of failure in the interval $[j, j + 1]$ conditional on surviving at least until j. Specifically, the discrete-time hazard rate (or failure rate, rate of death, instantaneous risk, etc.), which yields the conditional probability of exit at time t, is $h(t) = P(D = t|D \geq t)$, $t = 1, 2, \ldots, J - 1$, where D is a random variable representing the time at which the survival period ends (death). The hazard function at time t is thus interpreted as the rate of death at t. This follows directly from the fact that $1 - h(t) = \frac{S(t)}{S(t-1)}$.

The probability of surviving until t is defined as,

$$S(t) = P(D > t) = \prod_{j=1}^{t}[1 - h(j)], \qquad (1)$$

where $S(.)$ is a decreasing function such that $S(0) = 1$ (if $P(D = 0) = 0$) and $\lim_{t \to \infty} S(t) = 0$. In a proportional hazards framework, an extension to discrete time starts from the conditional survival function, $S(t|\mathbf{x}_i) = S_0(t)^{\exp(\mathbf{x}'_i\beta)}$, where S_0 is the baseline survival function and $S(t|\mathbf{x}_i)$ is the probability that a firm with covariates $\mathbf{x}_i$ survives until t. Moreover, given the relationship between the hazard and the survival function in (1), the complement of the hazard function is, $1 - h(t|\mathbf{x}_i) = [1 - h_0(t)]^{\exp(\mathbf{x}'_i\beta)}$, so that,

$$h(t|\mathbf{x}_i) = 1 - [1 - h_0(t)]^{\exp(\mathbf{x}'_i\beta)}. \qquad (2)$$

Applying the cloglog transformation to (2) yields,

$$\log(-\log[1 - h(t|\mathbf{x}_i)]) = \beta'\mathbf{x}_i + \gamma_j, \qquad (3)$$

where γ_j is the corresponding transformation of the baseline hazard, i.e. $\gamma_j := \log(-\log(1 - h_0(t)))$, with $j = 1, .., 8$, which indexes times at risk of death and the hazard depends on a vector of covariates $\mathbf{x}_i$ (which can be fixed or time-varying). The baseline hazard is then parameterized using a polynomial

specification (quadratic and cubic in duration), chosen due to its flexibility which allows the data to fit properly without parametric constraints associated with predetermined distribution functions (Mata, Antunes, and Portugal 2010). The model is then estimated resorting to *episode splitting*, that is transforming duration data into binary-outcomes (Dead = 1 for end of spell and Dead = 0 for survival).

Duration data typically displays censoring and frequently the exogenous determinants of the event times may change during the life cycle of the firm. Hazard-based duration models have been widely used in fields such as biometrics, economics, finance and industrial engineering, because they are able to accommodate both of these features in a relatively simple and flexible manner.

The distribution of duration is modelled via the probability of ending the survival spell (dying) at time t. In this context we intend to model and estimate the impact of covariates (group belonging) on the probabilities of failure, i.e. the hazard rates. In this setting there is left censoring, or *delayed entry*, and the hazard rates are to be interpreted as the probability of failure in t conditional on survival until $t - 1$.

C - Distribution of firms by activity

Hotels and Similar Accommodation is the activity with the largest number of firms in the Mainly Tourism sector, representing 58.7% and 42.9% of all firms of the sector in 2007 and 2015, respectively. Over the period of analysis travel agencies account for approximately 26%. Holiday and Short-stay Accommodation is the activity facing the highest growth in the number of firms during the period, representing 27.7% of all firms in this sector in 2015, more than doubling its 2007 prevalence. Restaurants, Bars and Passenger Land Transport are the largest activities in the Total Tourism sector, representing around 40%, 30% and 30%, respectively of firms in this sector throughout the period. Table C1 provides a detailed distribution of firms by activity in the Mainly Tourism sector.

Table C2 shows the distribution of firms by activity in the Partly Tourism sector. Food and beverage serving firms are the most prevalent activities within the Partly Tourism sector, with Restaurants and Bars accounting for around 67% of all firms. Passenger Land Transport providing firms, such as trains and buses, represent between 27% and 30% of firms in this sector.

Table C1. Mainly Tourism: Distribution by Main Activities.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Passanger air transport	0.59%	0.62%	0.68%	0.82%	0.70%	0.72%	0.70%	0.75%	0.75%	0.71%
Hotels and similar acc	58.68%	57.70%	57.46%	56.85%	56.03%	54.05%	52.53%	49.41%	42.93%	53.57%
Holiday and short-stay acc	12.79%	12.80%	13.17%	13.81%	14.87%	17.40%	18.45%	20.88%	27.66%	17.24%
Camping, recreational vehicle and trailer parks	1.77%	1.82%	1.65%	1.75%	1.71%	1.82%	1.83%	1.84%	1.84%	1.78%
Travel agencies	26.16%	27.06%	27.05%	26.77%	26.69%	26.01%	26.50%	27.13%	26.83%	26.69%
Total	2706	2742	2795	2802	2859	2914	3008	3200	3485	26511

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[14]The log(-log(.)) is the *complementary log-log* transformation which gives name to the cloglog model.

Table C2. Partly Tourism: Distribution by Main Activities.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Passenger land transport	30.59%	30.15%	29.98%	29.99%	29.66%	29.77%	29.60%	28.75%	27.62%	29.57%
Sea water trans	0.15%	0.19%	0.18%	0.17%	0.18%	0.18%	0.18%	0.21%	0.25%	0.19%
Inland water trans	0.09%	0.11%	0.10%	0.11%	0.10%	0.10%	0.10%	0.09%	0.09%	0.10%
Restaurants	37.05%	37.33%	37.50%	37.72%	37.97%	37.91%	37.93%	38.29%	39.30%	37.89%
Bars and Snack Bars	30.27%	30.36%	30.31%	29.99%	29.96%	29.82%	29.91%	30.32%	30.23%	30.13%
Renting of vehicles	1.47%	1.48%	1.51%	1.53%	1.56%	1.58%	1.62%	1.65%	1.75%	1.57%
Renting of goods	0.14%	0.15%	0.17%	0.20%	0.23%	0.25%	0.27%	0.33%	0.40%	0.24%
Reservation Services	0.23%	0.23%	0.25%	0.29%	0.35%	0.38%	0.38%	0.36%	0.37%	0.32%
Total	20037	20151	20085	19924	19961	19699	19457	19784	20247	179345

Table C3. Other Services: Distribution by Sector.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Wholesale and Retail	59.5%	58.8%	58.3%	58.0%	57.5%	57.0%	56.9%	56.7%	56.4%	57.7%
Transportation and Storage	7.4%	7.3%	7.3%	7.1%	6.9%	6.7%	6.5%	6.4%	6.3%	6.9%
Accommodation and Food Services	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
Information and Communication	3.4%	3.5%	3.6%	3.7%	3.8%	4.0%	4.2%	4.3%	4.3%	3.9%
Real Estate	5.3%	5.3%	5.2%	5.1%	5.0%	5.0%	5.0%	5.2%	5.4%	5.2%
Professional, Scientific, Technical	15.7%	16.1%	16.6%	17.1%	17.8%	18.3%	18.4%	18.5%	18.5%	17.5%
Administrative and Support	4.6%	4.8%	4.8%	4.8%	4.7%	4.8%	4.8%	4.8%	4.9%	4.8%
Other Services	3.9%	4.0%	4.0%	4.0%	4.0%	4.0%	3.9%	3.8%	3.9%	3.9%
Total	104735	107236	108078	107861	108696	109108	109130	111835	114646	981325

A large number of firms in Other Services are dedicated to Wholesale and Retail activities (around 60%), and Professional, Scientific and Technical activities, which represent between 14% and 17% of all Services firms. The prevalence of firms in the remaining sectors is relatively lower and can be observed in Table C3, which details the distribution of activities within the Services sector. While our sample includes only firms for which information and complete duration spells are available, final sample sectorial growth rates are analogous to those observed for the universe.

D - Summary Statistics

The main summary statistics for each sector are shown in Table D1. Manufacturing firms are the largest, while firms in the Other Services sector have higher SALES than firms in Total Tourism, both on average and at the median. This effect is driven by firms in the Partly Tourism sector, as firms in Mainly Tourism outperform Other Services and Partly Tourism. Firms in Mainly Tourism are the ones with the highest fixed assets as a share of total assets, followed by Partly Tourism and Manufacturing. Food and Beverage and, particularly, Accommodation firms rely heavily on buildings, while Manufacturers are intimately linked with factories and machinery. Firms in the tourism sectors are also on average more indebted, while Manufacturing is the sector where DEBT levels are on average lowest (considering the median instead, it is the firms in Other Services). Manufacturing firms are the most profitable, followed by firms in the Other Services

sector. Mainly Tourism firms are the worst performing both on average and at the median. Detailed yearly descriptive statistics are provided in Table D3 of the Appendix.

Considering the age profile of firms, Manufacturing firms are on average older and also exiting later when compared to firms in the Other Services sector. Firms associated with Tourism activities are the oldest among all groups, on average, despite the sectors' growth and dynamism which fosters the creation and entry of new firms in the market. This fact suggests that these firms may be more resilient than those in the remaining sectors, facing lower death probabilities (surviving for longer). This is particularly true for firms mainly dedicated to Tourism activities, where this effect may be larger. This argument seems to be supported by the Age Upon Death variable (see Table D1), which shows that Mainly Tourism firms indeed exit later, both on average and at the median.

Table D2 zooms in on the activities included in Total Tourism, which are the focal point of the analysis in section 4.3. Among these, Hotels and Transports are the oldest. Hotels and Other Accommodation naturally rely more heavily on fixed assets, but are also the most indebted. Transports firms are the most profitable while Bars exhibit average negative profitability. Unsurprisingly then, they are among the groups which exit younger, on average, together with Restaurants. Travel Agencies and Hotels are the ones with higher levels of SALES among all groups in our sample. Detailed statistics of firms' age profiles by year including the age distribution by sector, and the distribution of firms by age bin and sector confirm the discussed patterns (see Tables D4 to D6 in the Appendix).

Table D1. Summary Statistics - Total.

	Manufacturing	Other Services	Total Tourism	Mainly Tourism	Partly Tourism
AGE					
average	17.60	14.41	18.60	18.22	18.65
std	13.49	12.28	15.81	14.22	16.03
q50	14	11	13	15	13
SALES					
average	12.53	11.92	11.23	12.04	11.11
std	1.92	1.99	1.80	2.41	1.65
q50	12.40	11.88	11.26	12.16	11.17
ROTA					
average	4.38	4.11	1.51	0.67	2.68
std	9.78	9.55	10.21	8.12	12.47
q50	4.23	3.45	1.91	0.92	3.40
DEBT					
average	16.41	20.77	26.83	27.43	26.00
std	17.75	25.26	28.10	27.40	29.03
q50	11.29	10.65	17.52	19.70	14.04
FIXED					
average	29.39	23.32	56.55	57.79	54.81
std	19.15	28.53	29.50	29.61	29.24
q50	26.10	11.40	61.61	61.63	61.48
N	252413	981325	205856	26511	179345
Age Upon Death					
average	14.39	11.36	12.61	15.48	12.36
std	12.54	10.92	13.18	14.06	13.08
q50	10	8	8	12	8
N	13008	57501	12186	954	11232

Table D2. Summary Statistics - Sub-categories of Total Tourism.

	Transports	Restaurants	Bars	Travel Agencies	Hotels	Other Accomodation
Age						
average	21.77	16.71	18.29	15.40	21.71	11.72
std	16.79	15.22	16.05	12.71	15.12	10.08
q50	13	12	14	12	19	10
SALES						
average	10.15	11.69	11.27	12.62	12.34	10.06
std	1.12	1.70	1.54	2.36	2.03	2.47
q50	10.00	11.80	11.40	12.82	12.40	10.47
ROTA						
average	6.70	1.63	−1.63	2.67	0.35	−0.46
std	10.13	17.10	18.84	11.27	7.54	8.35
q50	4.75	3.05	1.86	3.19	0.73	0.14
DEBT						
average	9.10	21.10	16.96	7.86	29.29	25.29
std	14.07	27.65	26.28	13.30	27.44	31.86
q50	4.62	5.34	0	0.02	22.58	8.73
FIXED						
average	25.15	47.41	44.79	17.28	62.18	68.99
std	20.72	28.90	30.89	19.81	27.09	31.35
q50	18.99	47.04	43.86	10.21	66.30	82.73
N	53321	67956	54039	7077	14203	4571
Age Upon Death						
average	19.83	10.70	11.52	13.36	18.68	11.65
std	16.14	11.71	12.43	12.39	15.55	11.51
q50	13	6	7	9	15	10
N	1621	5240	4165	355	433	151

Table D3. Summary Statistics.

	2007					2008					2009				
	Manu	OServices	Ttour	Mtour	Ptour	Manu	OServices	Ttour	Mtour	Ptour	Manu	OServices	Ttour	Mtour	Ptour
AGE															
average	15.99	13.16	17.06	17.25	17.04	16.44	13.42	17.48	17.71	17.45	16.92	13.74	17.92	17.94	17.92
std	12.76	11.77	15.10	13.59	15.30	12.94	11.87	15.26	13.81	15.45	13.12	12.00	15.42	13.83	15.63
q50	13	9	11	14	10	13	10	11	14	10	13	10	11	14	11
SALES															
average	12.59	12.01	11.23	12.22	11.09	12.63	12.02	11.28	12.28	11.15	12.62	12.02	11.30	12.25	11.17
std	1.87	2.03	1.78	2.25	1.67	1.90	2.05	1.78	2.30	1.65	1.90	2.01	1.77	2.36	1.63
q50	12.46	11.99	11.26	12.31	11.17	12.50	12.00	11.30	12.38	11.22	12.50	11.98	11.33	12.38	11.24
ROTA															
average	5.79	5.72	2.45	1.29	3.91	6.48	5.62	4.05	3.23	5.06	4.83	5.17	2.62	1.75	3.70
std	9.49	9.96	8.76	6.94	10.43	8.94	9.26	9.18	7.28	10.98	8.68	10.50	8.99	7.46	10.48
q50	4.54	4.74	2.31	1.47	3.27	5.32	4.47	3.87	2.78	4.84	4.58	4.46	2.84	1.40	3.96
DEBT															
average	12.08	17.41	24.31	25.08	23.34	12.28	17.69	23.05	22.34	23.92	15.35	18.35	23.77	21.99	25.98
std	16.68	26.66	28.35	26.21	30.79	16.72	26.57	28.95	25.80	32.37	17.54	26.35	29.64	25.66	33.79
q50	3.78	0.06	12.98	15.69	0.17	4.33	0.87	9.66	11.29	0.45	9.45	3.34	8.80	14.23	2.56
FIXED															
average	29.98	29.69	56.58	57.04	56.02	28.76	29.17	56.54	56.15	57.02	29.30	31.31	57.09	56.47	57.85
std	18.96	29.96	28.93	29.22	28.56	18.68	29.41	29.53	29.98	28.98	18.88	30.16	29.10	29.04	29.16
q50	26.10	18.10	61.88	63.62	60.06	22.96	19.63	59.24	58.45	61.69	23.49	20.65	62.71	61.99	62.71
N	29018	104735	22743	2706	20037	28963	107263	22893	2742	20151	28503	108078	22880	2795	20085
Age upon death															
average	13.03	9.70	11.29	13.71	11.08	12.98	10.14	10.91	16.62	10.49	14.02	10.43	11.79	14.14	11.58
std	11.11	9.58	11.96	10.42	12.07	11.43	9.85	11.90	16.45	11.39	12.35	10.05	12.33	11.12	12.42
q50	9	7	7	12	7	9	7	7	12	7	9	7	7	13	7
N	1,623	6,658	1,391	111	1,280	1,924	7,608	1,508	104	1,404	1,838	7,373	1457	120	1,337

(Continued)

Table D3. (Continued).

	2010					2011					2012				
	Manu	OServices	Ttour	Mtour	Ptour	Manu	OServices	Ttour	Mtour	Ptour	Manu	OServices	Ttour	Mtour	Ptour
AGE															
average	17.42	14.15	18.40	18.41	18.40	17.87	14.54	18.82	18.72	18.84	18.16	14.84	19.22	18.83	19.28
std	13.28	12.12	15.58	14.03	15.79	13.42	12.24	15.75	14.14	15.97	13.59	12.38	15.91	14.24	16.14
q50	14	10	12	15	12	14	11	13	16	12	15	12	13	16	13
SALES															
average	12.54	11.97	11.29	12.19	11.17	12.57	11.99	11.31	12.17	11.18	12.52	11.92	11.28	12.04	11.17
std	1.86	1.97	1.75	2.28	1.63	1.87	1.94	1.74	2.25	1.62	1.91	1.94	1.77	2.37	1.63
q50	12.41	11.93	11.33	12.31	11.24	12.43	11.94	11.35	12.26	11.26	12.38	11.85	11.32	12.17	11.23
ROTA															
average	3.60	4.79	1.94	0.50	3.82	4.59	4.71	1.29	−0.12	3.40	4.08	3.17	0.23	−0.68	1.54
std	11.00	9.73	8.62	6.39	10.58	8.69	8.89	8.79	6.82	10.75	9.17	9.02	10.95	10.86	10.95
q50	3.99	3.75	2.31	0.61	4.17	4.24	3.85	1.28	0.25	3.58	4.16	1.97	1.14	0.44	1.40
DEBT															
average	17.76	17.93	23.70	23.09	24.50	18.95	21.56	28.61	27.80	29.81	18.98	21.42	29.13	30.17	27.65
std	18.54	25.16	28.75	25.19	32.83	17.81	23.64	25.24	25.30	25.10	17.94	24.03	25.68	25.97	25.20
q50	14.20	3.14	11.08	15.94	4.13	15.41	12.70	22.58	22.58	29.56	14.21	12.73	26.41	28.13	23.65
FIXED															
average	29.83	31.79	56.75	56.42	57.18	29.66	20.27	57.35	58.46	55.71	29.78	20.17	56.84	58.49	54.49
std	19.27	30.74	29.51	29.25	29.84	19.02	27.21	28.95	28.45	29.60	19.28	27.24	29.02	29.45	28.23
q50	23.87	21.61	61.29	60.70	61.48	28.00	8.59	64.05	64.05	63.96	27.99	8.09	62.49	61.61	66.83
N	27879	107861	22726	2802	19924	27598	108696	22820	2859	19961	27334	109108	22613	2914	19699
Age upon death															
average	14.24	10.82	11.70	15.64	11.38	15.50	11.44	12.72	16.48	12.41	15.15	12.06	13.83	15.99	13.65
std	12.33	10.33	12.23	13.74	12.05	13.23	10.73	13.46	15.66	13.22	12.75	11.30	13.77	13.35	13.79
q50	10	8	7	12	7	11	8	8	12	8	12	9	10	13	9
N	1,469	6,372	1183	87	1,096	1,650	7,084	1525	117	1408	1485	6743	1514	115	1399

(Continued)

Table D3. (Continued).

		2013					2014					2015			
	Manu	OServices	Ttour	Mtour	Ptour	Manu	OServices	Ttour	Mtour	Ptour	Manu	OServices	Ttour	Mtour	Ptour
AGE															
average	18.50	15.17	19.58	18.86	19.69	18.58	15.22	19.49	18.43	19.67	18.66	15.35	19.36	17.75	19.64
std	13.78	12.50	16.11	14.43	16.35	14.04	12.62	16.33	14.67	16.58	14.20	12.71	16.49	14.82	16.74
q50	15	12	14	16	14	15	13	15	15	14	15	13	15	15	15
SALES															
average	12.46	11.84	11.17	11.93	11.05	12.42	11.78	11.10	11.77	10.99	12.43	11.79	11.13	11.64	11.04
std	1.94	1.96	1.75	2.36	1.61	1.99	2.00	1.86	2.54	1.71	1.98	1.99	1.91	2.72	1.71
q50	12.32	11.78	11.17	12.06	11.08	12.30	11.73	11.12	11.91	11.03	12.30	11.74	11.17	11.86	11.09
ROTA															
average	3.18	2.67	−0.82	−0.61	−1.14	3.58	3.32	0.78	0.51	1.20	3.68	3.41	1.67	1.03	2.68
std	9.62	8.51	10.80	7.21	14.56	10.40	8.41	11.80	9.24	15.00	11.16	11.23	12.11	8.51	16.20
q50	3.11	2.30	0.81	−0.05	1.41	3.71	2.30	1.66	0.89	3.56	4.22	3.35	2.05	1.25	2.89
DEBT															
average	16.18	22.91	30.35	30.67	29.87	18.24	22.84	28.95	31.86	24.31	16.75	23.03	28.27	31.13	23.74
std	16.90	24.59	28.78	28.43	29.30	18.42	24.69	28.10	29.76	24.53	17.44	25.91	28.52	30.69	24.02
q50	13.10	15.23	24.60	25.30	21.66	12.73	15.97	21.04	24.05	17.53	14.13	13.08	19.39	21.35	17.16
FIXED															
average	29.67	18.68	56.44	58.67	53.13	28.71	18.56	55.80	59.08	50.56	28.86	19.16	55.46	58.52	50.61
std	19.33	26.31	29.67	29.86	29.09	19.35	26.41	30.04	30.20	29.03	19.42	26.86	30.61	30.84	29.62
q50	28.21	5.99	62.17	64.03	59.84	27.45	5.44	62.34	66.36	57.03	26.33	5.34	60.58	61.64	58.50
N	27062	109130	22465	3008	19457	27649	111835	22984	3200	19784	28407	114646	23732	3485	20247
Age upon death															
average	14.99	12.77	13.52	17.01	13.24	15.44	13.02	13.92	15.65	13.77	15.58	13.17	14.29	14.41	14.27
std	12.49	11.93	13.71	16.34	13.45	14.18	12.37	14.85	14.33	14.90	13.90	12.27	14.08	14.64	14.03
q50	12	9	9	10	9	11	9	9	10	8	11	9	10	10	10
N	1090	5857	1296	95	1201	940	4902	1168	97	1071	989	4904	1144	108	1036

Note: Manu, OServices, Ttour, Mtour and Ptour, refer to Manufacturing, Other Services, Total Tourism, Mainly Tourism and Partly Tourism, respectively.

Table D4. Age Descriptives - Tourism.

	Total Tourism						Mainly Tourism						Partly Tourism					
	Avg	std	q25	q50	q75	N	Avg	std	q25	q50	q75	N	Avg	std	q25	q50	q75	N
2007	17.06	15.10	7	11	24	22743	17.25	13.59	7	14	22	2706	17.04	15.30	7	10	24	20037
2008	17.48	15.26	7	11	24	22893	17.71	13.81	8	14	23	2742	17.45	15.45	7	10	24	20151
2009	17.92	15.42	8	11	24	22880	17.94	13.83	8	14	24	2795	17.92	15.63	8	11	24	20085
2010	18.40	15.58	8	12	25	22726	18.41	14.03	8	15	24	2802	18.40	15.79	8	12	25	19924
2011	18.82	15.75	8	13	25	22820	18.72	14.14	8	16	25	2859	18.84	15.97	8	12	25	19961
2012	19.22	15.91	8	13	26	22613	18.83	14.24	8	16	25	2914	19.28	16.14	8	13	26	19699
2013	19.58	16.11	8	14	26	22465	18.86	14.43	8	16	26	3008	19.69	16.35	8	14	26	19457
2014	19.49	16.33	7	15	26	22984	18.43	14.67	7	15	26	3200	19.67	16.58	7	14	26	19784
2015	19.36	16.49	6	15	26	23732	17.75	14.82	5	15	26	3485	19.64	16.74	7	15	26	20247
Total	18.60	15.81	7	13	25	205856	18.22	14.22	8	15	25	26511	18.65	16.03	7	13	26	179345

	Total Tourism						Mainly Tourism						Partly Tourism					
Age group	1 to 5	5 to 10	10 to 20	20 to 30	30 to 40	N	1 to 5	5 to 10	10 to 20	20 to 30	30 to 40	N	1 to 5	5 to 10	10 to 20	20 to 30	30 to 40	N
2007	17.8%	29.0%	22.5%	10.6%	5.5%	22743	16.0%	17.9%	32.6%	19.4%	6.3%	2706	18.0%	30.5%	21.2%	9.4%	5.4%	20037
2008	18.1%	25.9%	24.6%	11.1%	5.7%	22893	15.5%	16.5%	33.2%	19.3%	7.3%	2742	18.5%	27.1%	23.4%	9.9%	5.4%	20151
2009	18.2%	21.2%	28.3%	11.5%	5.9%	22880	15.9%	15.3%	32.8%	19.5%	8.5%	2795	18.6%	22.1%	27.7%	10.4%	5.6%	20085
2010	18.0%	13.2%	35.7%	11.8%	6.4%	22726	15.8%	14.0%	32.8%	19.8%	9.4%	2802	18.3%	13.1%	36.1%	10.7%	6.0%	19924
2011	17.9%	11.6%	36.8%	12.1%	6.6%	22820	15.6%	12.8%	33.9%	19.4%	9.8%	2859	18.2%	11.4%	37.3%	11.1%	6.1%	19961
2012	17.9%	11.4%	36.3%	12.8%	6.6%	22613	16.6%	12.0%	32.7%	20.2%	10.0%	2914	18.1%	11.3%	36.9%	11.7%	6.1%	19699
2013	17.5%	12.1%	35.1%	13.8%	6.5%	22465	16.9%	13.1%	30.9%	20.6%	9.9%	3008	17.6%	11.9%	35.8%	12.7%	6.0%	19457
2014	19.9%	11.5%	33.3%	14.0%	6.5%	22984	20.8%	12.3%	28.2%	20.4%	10.2%	3200	19.8%	11.3%	34.1%	13.0%	5.9%	19784
2015	22.2%	11.2%	31.4%	14.0%	6.6%	23732	25.1%	12.5%	24.5%	20.1%	10.2%	3485	21.8%	11.0%	32.6%	13.0%	6.0%	20247
Total	18.6%	16.3%	31.6%	12.4%	6.3%	205856	17.8%	14.0%	31.1%	19.9%	9.1%	26511	18.8%	16.7%	31.6%	11.3%	5.8%	179345

Table D5. Age Descriptives - Non-Tourism Sectors.

	Manufacturing						Other Services					
	Avg	std	q25	q50	q75	N	Avg	std	q25	q50	q75	N
2007	15.99	12.76	7	13	21	29018	13.16	11.77	5	9	17	104735
2008	16.44	12.94	7	13	22	28963	13.42	11.87	5	10	18	107236
2009	16.92	13.12	8	13	23	28503	13.74	12.00	5	10	18	108078
2010	17.42	13.28	8	14	23	27879	14.15	12.12	6	10	19	107861
2011	17.87	13.42	8	14	24	27598	14.54	12.24	6	11	19	108696
2012	18.16	13.59	8	15	25	27334	14.84	12.38	6	12	20	109108
2013	18.50	13.78	8	15	25	27062	15.17	12.50	6	12	20	109130
2014	18.58	14.04	8	15	26	27649	15.22	12.62	6	13	21	111835
2015	18.66	14.20	8	15	26	28407	15.35	12.71	6	13	21	114646
Total	17.60	13.49	8	14	24	252413	14.41	12.28	6	11	19	981325

	Manufacturing						Other Services					
Age group	1 to 5	5 to 10	10 to 20	20 to 30	30 to 40	N	1 to 5	5 to 10	10 to 20	20 to 30	30 to 40	N
2007	16.0%	23.8%	30.2%	17.0%	7.7%	29018	25.7%	24.4%	29.8%	11.5%	4.4%	104735
2008	16.2%	22.4%	29.2%	18.3%	8.2%	28963	25.4%	23.5%	29.8%	12.4%	4.6%	107236
2009	16.5%	21.1%	28.4%	19.5%	8.7%	28503	25.3%	22.4%	29.9%	13.3%	4.8%	108078
2010	16.3%	14.0%	34.0%	19.8%	9.6%	27879	24.3%	19.4%	32.8%	13.8%	5.3%	107861
2011	15.8%	12.0%	35.4%	20.2%	10.1%	27598	23.3%	17.3%	34.8%	14.4%	5.7%	108696
2012	16.2%	12.0%	34.0%	20.9%	10.0%	27334	22.5%	17.3%	34.6%	15.3%	5.7%	109108
2013	15.9%	12.6%	33.0%	21.2%	10.1%	27062	21.5%	17.6%	34.2%	16.1%	5.9%	109130
2014	17.9%	11.9%	31.2%	21.4%	10.2%	27649	23.1%	16.4%	33.2%	16.6%	6.0%	111835
2015	19.1%	11.6%	30.1%	20.9%	10.6%	28407	24.0%	15.6%	32.4%	16.8%	6.3%	114646
Total	16.7%	15.8%	31.7%	19.9%	9.5%	252413	23.9%	19.3%	32.4%	14.5%	5.4%	981325

Table D6. Age Descriptives - Sub-categories of Total Tourism - Part 1.

	Transports						Restaurants						Bars					
	Avg	std	q25	q50	q75	N	Avg	std	q25	q50	q75	N	Avg	std	q25	q50	q75	N
2007	18.92	16.36	7	8	40	6150	15.53	14.45	5	11	21	7424	17.12	15.21	6	13	22	6065
2008	19.79	16.44	8	9	41	6097	15.78	14.62	5	11	21	7523	17.33	15.36	6	13	23	6118
2009	20.58	16.50	9	10	42	6046	16.12	14.82	5	11	22	7532	17.72	15.62	6	13	24	6088
2010	21.21	16.57	10	11	43	6005	16.45	14.98	6	12	22	7516	18.24	15.83	6	14	25	5976
2011	21.93	16.68	11	12	44	5953	16.83	15.17	6	12	23	7580	18.58	16.03	6	14	25	5980
2012	22.58	16.74	12	13	45	5898	17.22	15.37	6	12	23	7468	18.88	16.23	6	15	26	5875
2013	23.10	16.87	13	14	46	5799	17.65	15.63	6	13	24	7381	19.18	16.44	6	15	26	5819
2014	23.78	17.02	14	15	47	5729	17.50	15.78	6	13	24	7575	18.83	16.68	6	14	27	5998
2015	24.41	17.13	15	16	48	5644	17.23	15.89	5	13	24	7957	18.78	16.84	5	14	27	6120
Total	21.77	16.79	9	13	42	53321	16.70	15.22	6	12	23	67956	18.29	16.05	6	14	25	54039

	Transports						Restaurants						Bars					
Age group	1 to 5	5 to 10	10 to 20	20 to 30	30 to 40	N	1 to 5	5 to 10	10 to 20	20 to 30	30 to 40	N	1 to 5	5 to 10	10 to 20	20 to 30	30 to 40	N
2007	4.0%	58.0%	4.3%	0.4%	1.4%	6150	25.7%	19.5%	27.8%	12.4%	7.2%	7424	22.8%	16.4%	29.3%	14.6%	7.5%	6065
2008	4.1%	49.7%	12.7%	0.4%	0.8%	6097	25.9%	18.6%	27.6%	13.1%	7.4%	7523	23.5%	15.6%	28.3%	15.2%	7.8%	6118
2009	4.7%	34.1%	28.0%	0.3%	0.8%	6046	25.6%	18.0%	27.3%	13.8%	7.6%	7532	23.4%	15.6%	27.3%	15.7%	7.9%	6088
2010	5.7%	6.6%	55.0%	0.4%	0.7%	6005	24.9%	16.7%	28.2%	14.2%	7.9%	7516	22.5%	14.8%	27.1%	16.1%	9.1%	5976
2011	6.3%	3.8%	57.6%	0.4%	0.8%	5953	24.2%	15.6%	29.2%	14.6%	8.1%	7580	22.2%	13.6%	27.6%	16.8%	9.0%	5980
2012	6.4%	4.0%	57.3%	0.9%	0.7%	5898	23.7%	15.2%	28.9%	15.3%	8.0%	7468	22.1%	13.4%	26.7%	17.4%	9.2%	5875
2013	7.0%	4.9%	55.6%	1.7%	0.7%	5799	22.4%	15.7%	28.4%	16.4%	7.9%	7381	21.4%	13.8%	25.7%	18.7%	9.1%	5819
2014	7.5%	5.2%	54.3%	2.5%	0.5%	5729	24.4%	14.9%	27.3%	16.3%	7.8%	7575	25.0%	12.5%	24.0%	18.5%	8.7%	5998
2015	7.8%	5.4%	53.6%	3.0%	0.5%	5644	27.5%	13.6%	25.5%	16.1%	7.7%	7957	26.3%	12.3%	23.1%	17.8%	8.8%	6120
Total	5.9%	19.5%	41.6%	1.1%	0.8%	53321	24.9%	16.4%	27.8%	14.7%	7.7%	67956	23.3%	14.2%	26.6%	16.8%	8.5%	54039

(*Continued*)

Table D6. (Continued).

	Travel Agencies						Hotels						Other Accommodation					
	Avg	std	q25	q50	q75	N	Avg	std	q25	q50	q75	N	Avg	std	q25	q50	q75	N
2007	15.06	12.39	6	12	22	708	19.72	14.47	9	17	26	1588	10.56	8.37	6	9	12	346
2008	14.96	12.55	6	12	21	742	20.50	14.67	10	18	27	1582	11.04	8.49	7	10	13	351
2009	15.15	12.57	6	12	20.5	756	20.76	14.67	10	18	28	1606	11.36	8.81	6	10	14	368
2010	15.65	12.69	6	12	20	750	21.42	14.88	11	19	29	1593	11.56	9.06	6	10	15	387
2011	15.85	12.74	6	12	20	763	22.01	15.02	11	19	29	1602	11.48	8.73	5	10	15	425
2012	16.01	12.59	6	13	21	758	22.55	15.20	12	20	30	1575	11.51	9.17	5	11	15	507
2013	15.75	12.81	6	12	21	797	22.89	15.36	12	21	30	1580	11.78	9.64	4	11	16	555
2014	15.31	12.96	5	12	21	868	22.83	15.74	11	21	30	1581	12.02	10.40	4	10	17	668
2015	14.92	12.93	5	11	21	935	22.81	15.71	11	21	30	1496	12.57	12.69	3	8	18	964
Total	15.40	12.70	6	12	21	7077	21.71	15.12	11	19	29	14203	11.72	10.08	5	10	15	4571

	Travel Agencies						Hotels						Other Accommodation					
Age group	1 to 5	5 to 10	10 to 20	20 to 30	30 to 40	N	1 to 5	5 to 10	10 to 20	20 to 30	30 to 40	N	1 to 5	5 to 10	10 to 20	20 to 30	30 to 40	N
2007	23.3%	18.4%	30.9%	17.7%	3.7%	708	12.0%	15.1%	31.1%	22.7%	8.9%	1588	20.2%	30.3%	42.2%	5.2%	0.6%	346
2008	24.9%	17.5%	31.1%	15.9%	4.4%	742	10.7%	13.5%	31.4%	23.5%	10.1%	1582	18.2%	28.8%	44.7%	6.0%	0.9%	351
2009	24.3%	16.9%	33.2%	13.6%	6.2%	756	11.1%	12.0%	30.6%	24.3%	11.2%	1606	20.1%	27.2%	42.1%	7.9%	1.4%	368
2010	22.9%	16.7%	34.0%	13.5%	6.7%	750	10.7%	10.7%	30.1%	24.9%	12.6%	1593	22.7%	23.0%	42.9%	8.3%	1.8%	387
2011	20.6%	18.6%	34.5%	12.7%	7.7%	763	10.2%	9.4%	30.6%	25.3%	12.7%	1602	27.3%	16.0%	46.1%	7.5%	2.1%	425
2012	19.0%	19.3%	33.5%	13.1%	9.5%	758	10.7%	8.3%	29.6%	26.4%	12.6%	1575	31.2%	13.8%	41.8%	10.1%	1.8%	507
2013	21.1%	19.6%	30.5%	13.8%	9.3%	797	10.2%	9.4%	27.7%	27.2%	12.8%	1580	30.6%	15.0%	40.9%	10.3%	1.8%	555
2014	25.3%	18.5%	26.4%	14.6%	9.7%	868	12.7%	8.8%	25.9%	26.8%	13.2%	1581	34.4%	12.7%	36.1%	12.3%	2.7%	668
2015	28.1%	17.8%	24.7%	15.1%	9.5%	935	13.8%	8.9%	23.3%	27.5%	14.4%	1496	40.0%	13.1%	26.1%	13.3%	3.8%	964
Total	23.4%	18.1%	30.7%	14.4%	7.5%	7077	11.3%	10.7%	29.0%	25.4%	12.0%	14203	29.7%	18.1%	38.3%	9.8%	2.2%	4571