UCD CENTRE FOR ECONOMIC RESEARCH

WORKING PAPER SERIES

2019

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WP19/23

October 2019

UCD SCHOOL OF ECONOMICS
UNIVERSITY COLLEGE DUBLIN
BELFIELD DUBLIN 4

Products or markets: what type of experience matters for export survival?

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October 1, 2019

Abstract

Previous research has generally shown that increased export experience has a positive impact on the subsequent survival of newly launched export relationships of a firm. In this paper, we find that there are important differences in the effects of firm experience on export survival depending on the source of the experience. Specifically, experience built up by a firm from previously exporting a particular product before launching it in a new market has a strong positive impact on the survival of a new product-market relationship. In contrast, experience within a market prior to adding a new product has a mainly negative effect on the survival probability of the additional product. This shows that taking a successful product to new markets is more likely to succeed than expanding product range within a market.

JEL Classification: F10
Keywords: Duration of Trade, Firm Survival, Export Experience, Multi-product firms

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‡This research uses statistical data from the Central Statistics Office (CSO) of Ireland. The permission for controlled access to confidential micro data sets has been granted in line with the Statistics Act, 1993. The use of these statistical data does not imply the endorsement of the CSO in relation to the analysis or interpretation of the statistical data. We would like to thank Orla McCarthy, Damian Malone, Ben Berstock and Kathleen Leonard in the CSO for support with the data. Contact: martina.lawless@esri.ie or zuzanna.studnicka@ucd.ie

1 Introduction

Building up experience as an exporter has been shown to have a positive effect on export survival at the firm level with greater size and existing export scope reducing the risk of failure if the firm moves into new export market (see e.g. Görg et al. (2012), Albornoz et al. (2016), Araujo et al. (2016), Inui et al. (2017) and Aeberhardt et al. (2014)). However, looking at the survival probabilities of new product-destination launches at the firm level, Lawless and Studnicka (2019) found that as the firm expanded their product range, the benefit to experience began to decline. This effect is, however, non-linear and depends on the number of products exported and on the proximity of the newly launched product to the core competence of the firm.

This paper shows evidence that different types of experience can actually have different effects on the survival of new trade relationships. This distinction between experience with a product and experience in a market has not previously been made in this literature with an implicit assumption perhaps being made that all experience is of equal weight. However, we find that in the context of multi-product exporters that this is not the case. At the launch of a new product-market combination, having built up previous experience in the product is a strong predictor of success of the new pairing but prior experience in the market has the opposite effect, actually increasing the probability of exit.

Our paper relates to the studies of the duration of trade at the country as well as at the firm level (see e.g. Besedeš and Prusa (2006a, 2006b), Görg et al. (2012)). A key finding of this literature is that surviving the first year is the most difficult and that product and geographic diversification help increase export survival (see e.g., Volpe-Martincus and Carballo (2009), Görg et al. (2012), Inui et al. (2017)). This is consistent with the stability of many trade relationships at the country and firm level but still leaves something of a puzzle in terms of the very short durations of individual product-destination flows.

A number of recent papers have examined the role of experience in determining the longevity of new export relationships, using a range of different indicators to capture the extent of this experience. For example, in their study on market-level survival Aeberhardt et al. (2014) measure experience as the interaction of past export status with firms' total export experience and find that this improves survival as the firm moves in to a new market. In related studies, Araujo et al. (2016) define experience as the number of similar destinations the firm already serves, with similarity based on the extended gravity framework of Morales et al. (2019). Similarly, Albornoz et al. (2016) use export survival time, number of export markets, number of previous incursions and export exposure as their measures of experience. More directly, Inui et al. (2017) define experience as number of years of firm-export spells up to the current year. Their results show a positive effect of experience on firm export status.

In motivating our paper, it is important to note that these papers are focused on firm survival in entering an entirely new market. Our analysis takes place at a more granular level, examining the survival of new product-market relationships. The question posed

here is therefore to what extent experience in a particular market facilitates the survival of an additional product being introduced to that market by a firm? Likewise, does having previous experience with a product make it more successful if the firm goes to launch this same product in a new market? *A priori*, one might assume the answer to both questions would be the same; experience would gain the firm information on the product's likely demand and profitability both overall and within individual markets while experience within a market would result in lower costs of adding an additional product given that customer contacts have been made, distribution networks established and so on.

However, we find that there are important differences in the effects on export survival of different types of experience. Specifically, experience built up from previously exporting a particular product has a consistently more positive impact than experience within a market where diminishing returns appear to set in rather rapidly at the firm level if it adds more products to an existing market.

Although the finding that firm familiarity with the destination it is introducing a product to is negatively related to the product's survival probability appears somewhat counter-intuitive, we argue that these findings are consistent with a number of the features of models of multi-product firms. In models such as Eckel and Neary (2010), Bernard et al. (2011) or Mayer et al. (2014), firms tend to begin exporting by launching the products closest to their core competency and selling them across a broad range of markets. Extensive previous experience in exporting a product to other markets is one proxy for how central the product is to the firm's core competency. The positive effects of product-level experience and scope in this case act as proxies for the product's position in the firm competency ranking. Validating this interpretation, we show that the distance of the new products to the core competency (proxied by the largest export sales) of the firm plays an important role in determining the survival of new product-market flows. Conversely, as a firm introduces more products to an individual market, it becomes more likely that each additional product is becoming further away from this core competency and hence we see a lower survival probability for later products within any individual market.

The remainder of the paper is structured as follows. Section 2 describes the data source and presents the descriptive statistics. Section 3 presents the results on the effects of different types of export experience on survival of new export flows along with a range of robustness checks. Finally, Section 4 concludes.

2 Data and summary statistics

Our principal source of information is confidential data on Irish firms from the Central Statistics Office (CSO). It covers statistics on merchandise exports of manufacturing enterprises in Ireland broken down by product (CN 8-digit level) and destination at annual frequency. We combine this data with enterprise accounting variables (collected via the Census of Industrial Production). The availability of data at the enterprise-

product-destination level provides a significant degree of additional information on export activity and firm performance which has rarely been available in the past.[1] Our trade data set covers the period from 1996 to 2015.

2.1 Export duration

One of the key strengths of this data source in addressing our key questions of interest relating to firm experience and trade survival is the long time period that the data covers. This allows us to focus our analysis of new trading spells on data from the most recent ten years while exploiting the prior data to measure pre-existing experience. To do this, we exclude the first ten years of our data from the calculation of export survival but use it in generating our experience variables. Specifically, we calculate firm experience from 1996 on, and export duration from 2006 on.[2] It means that our maximum firm experience is 19 years whereas our maximum spell length is 9 years as the data from 2015 is used only to identify spells which ended in 2014.

We define the duration of exports as the number of years a trade relationship has been active. In survival analysis, a terminological distinction is made between a "relationship" and a "spell". Each export relationship may consist of a single spell or of multiple spells. The latter occurs when exports are stopped and restarted later on. This distinction, however, as reported in Besedeš and Prusa (2006b) has only a very small impact on the results of most of the trade survival studies. Therefore, in the core of our analysis we use trade relationships (single spells) rather than multiple spells, meaning that we do not take into account breaks in between spells.

To calculate the duration of firm-product-destination trade we need to take into account several data issues. In common with other European countries, the Irish trade data is collected separately for intra-EU (IntraStat survey) and extra-EU (Extrastat survey) trade. The potential difficulty this generates for research use is that the threshold for reporting of exports differs between the two systems, with Intrastat requiring an exporting volume of above €635,000 per annum whereas the Extrastat threshold is considerably lower and collects information on all transactions above €254. However, we have checked the robustness of our results by dividing companies into intra- and extra-EU exporters and it does not affect our results.[3]

The second data cleaning issue to be dealt with is that the original trade data is recorded at the 8-digit level in the CN classification but these are not completely stable categories over time. To ensure that our results are not biased by changes in product definitions, we use concordance tables to transform the classification backwards to a constant CN 1996 terminology. We take a conservative approach to this by limiting the product scope to products existing in 1996. Re-coding CN 8-digit products implies

[1] A detailed description of the patterns of trade - particularly of Irish-owned firms - coming from this data is provided by Lawless, Siedschlag and Studnicka (2017, 2019).

[2] Note that there is no need to control for left-censoring to calculate firm level experience as keeping firms active in 1996 makes our main finding even more robust.

[3] These results are available on request.

replacing code at time t backwards to $t-1$. That means that re-coding the last year in our sample (2015) requires going back year by year from 2015 to 1996, applying 19 transformations. This procedure creates a problem when trying to replace codes from a shrinking category (i.e., when two or more CN codes at the time $t-1$ were replaced by only one CN code at the time t). In this case we merge them into one of the former codes. In addition, in order to avoid an excessive product entry/exit due to this high level of disaggregation (see e.g., Besedeš and Prusa, 2006a) we aggregate our product level data to HS 6-digit level product categories.

2.2 Firm experience

We define firm experience at three different levels: (1) the number of years a firm has been an active exporter before launching exports of a new product to a new destination, (2) the number of years a firm has been exporting to a particular destination before launching a new product in this market, (3) the number of years a firm has been exporting a particular product before launching it in a new destination.

In addition, we use product (measured by the initial number of products exported) and market diversification (measured by the initial number of destinations) as a further expertise measure. We also use the number of destinations by product and the number of products by destination as measures of diversification. The correlation matrix between these variables is shown in the appendix. We also calculate the initial value of exports by product to account for the fact that more experienced firms face lower uncertainty and therefore tend to have larger values of their initial exports by product. New firms, on the contrary, start by attempting small-scale projects. This has been shown to affect the product's chances of survival (see e.g., Rauch and Watson (2003), Besedeš and Prusa (2006b) and Araujo et al. (2016)).

Table 1 presents summary statistics of our experience variables. Our final data set consists of 1,790 firms with 1,062 firms on average per year. The total number of firm-product-destination spells during the analysed period is 107,993 (11,999 spells on average per year). As spells may last several years, this gives us a total number of observations of 191,742. It can be seen that the average firm experience at the beginning of a new product-destination spell is 11 years, while an average destination and product experience are 8 and 5.1 years respectively. The average number of destinations by firm at the beginning of a new spell is 34.8 and the average number of products at the beginning of each spell is 43.2.[4]

Figure 1 shows the relationship between survival of product-destination matches and the key experience measures at the firm, destination and product level (aggregated into three groups of experience) using the nonparametric lifetable estimator of the survivor functions for the period 2006-2014. The life table estimator of the survivor function can be defined as:

[4]Note that this is calculated at the level of an individual spell by firm and not at the firm level. At the firm level, firm exported on average 12 products, to 11 destinations.

$$\hat{S}(t) = \prod_{k=1}^{k_{max}} \frac{n_k - d_k}{n_k} \tag{1}$$

where N_k is the number of spells at risk at the beginning of interval t_k, d_k as the number of failures; and n_k the adjusted number of spells at risk at the midpoint of the interval.[5] The survior function is therefore a cumulative probability of survival up to a given point in time after the launch of the spell.

Table 1: Summary statistics at the beginning of a new trade spell

	Obs	Mean	Std. Dev.	Min	Max
Initial firm experience	107,993	11.1	5.2	1	19
Experience of existing destination	107,993	8.0	5.6	1	19
Experience of existing product	107,993	5.1	5.1	1	19
Number of destinations by firm	107,993	34.8	29.3	1	143
Number of products by firm	107,993	43.2	44.2	1	300
Number of destinations by product	107,993	8.5	13.7	1	130
Number of products by destination	107,993	11.1	17.5	1	242
Initial exports (EUR '000s)	107,993	270	10,838	0.001	2,300,457

2.3 Product proximity

In order to capture the similarity of products being exported by the same firm, we use the proximity measure constructed by Hidalgo et al. (2007). It is based on the idea that two products that require similar institutions, capital, infrastructure, technology, etc. are likely to be produced in tandem (similar goods). Dissimilar goods, on the other hand, are less likely to be co-produced. This indicator uses as its basis the concept of revealed comparative advantage (RCA) developed by Balassa (1965), which measures whether country c exports more of good i as the share of its total exports than the average country.

Formally the proximity ϕ between products i and j is the minimum of pairwise conditional probabilities of a country exporting a good given that it exports another at the SITC 4-digit level.

$$\phi_{i,j} = min\left\{P(RCAx_i \mid (RCAx_j), P(RCAx_j \mid (RCAx_i)\right\} \tag{2}$$

Where RCA is revealed comparative advantage defined as follows

$$RCA_{c,i} = \frac{x(c,i)}{\sum_i x(c,i)} \Big/ \frac{\sum_c x(c,i)}{\sum_{c,i} x(c,i)} \tag{3}$$

[5] $n_k = N_k - \frac{d_k}{2}$

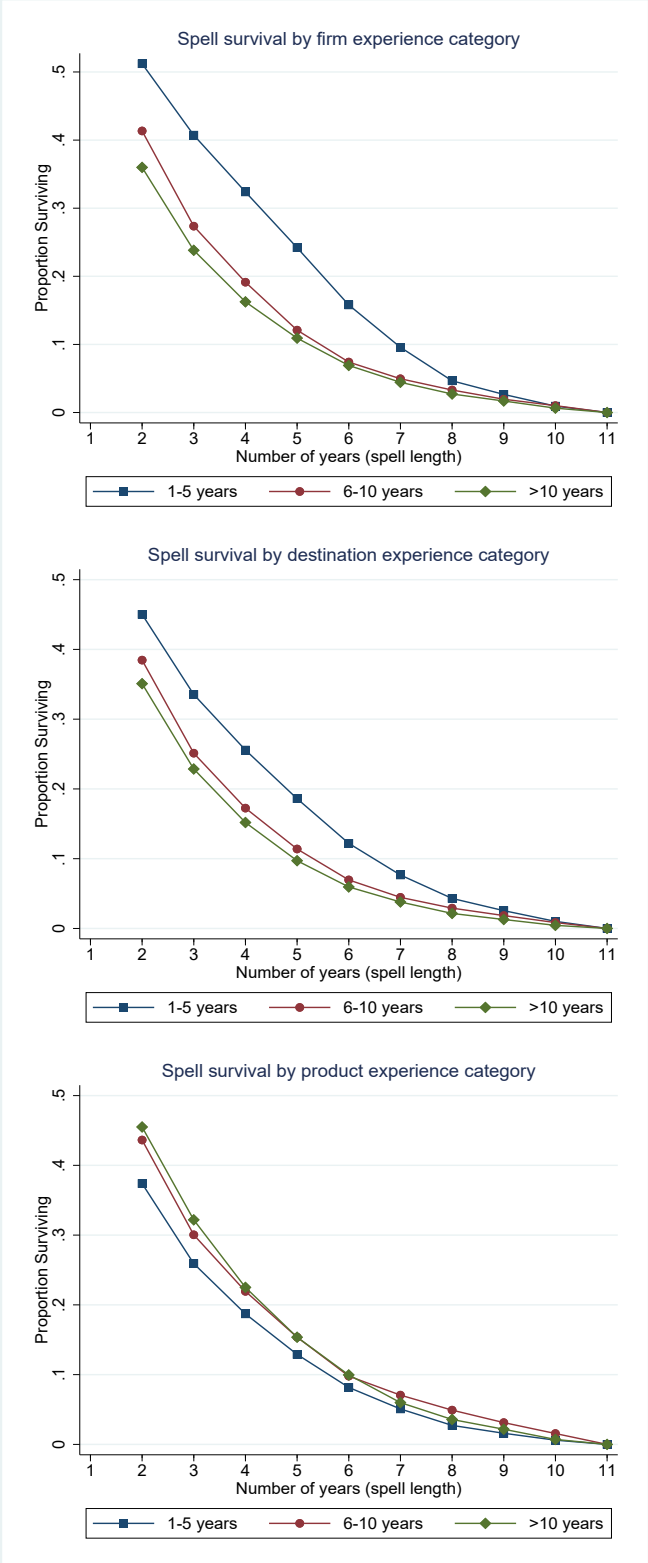
Hidalgo et al. (2007) generate proximity measures between all SITC 4-digit level products using world trade flows. We apply this to capture the proximity of each new product introduced by firm at time t to its core product. We define the firm's core product as being its product with the largest export value at SITC 4-digit level.[6] The proximity measure varies between 0 and 1. In our data, the average proximity is of a new product when it is launched is 0.50 and the median proximity is 0.35. Figure 2 shows how the proximity to existing core products reduce as the firm's product range expands.

Finally, we use country characteristics as well as gravity data. These come from the World Development Indicators, Worldwide Governance Indicators and CEPII. To obtain real values of GDP and trade we use Euro Area GDP deflator expressed in 2010 EUR, coming from the International Monetary Fund (IMF).[7]

[6]SITC codes are included in the CSO data.

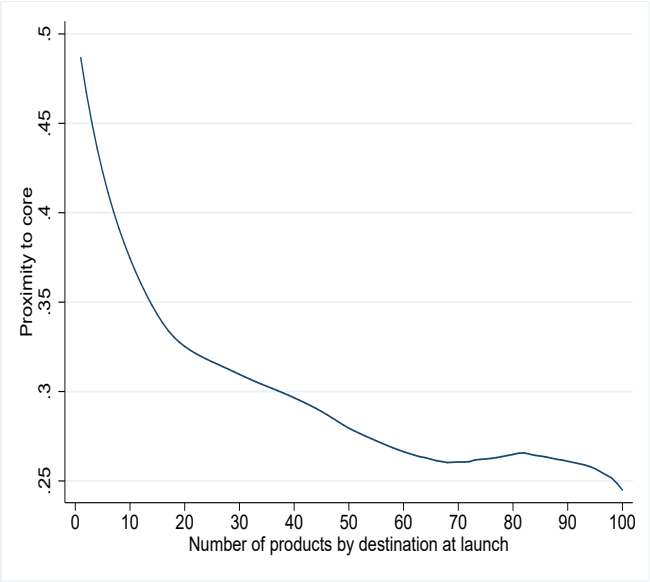
[7]To covert the data to EUR we use Dollar/Eur exchange rate from Federal eserved Bank of St. Louis.

Figure 1: Survival probability over time of product-destination export relationships



Source: Own calculations based on the CSO data (2019)

Figure 2: Proximity of newly launched product to core by product count



Source: Own calculations based on the CSO data (2019)
Note: Lowess smoothing parameter of 0.4 applied.

3 Effects of experience on export spell survival

3.1 Estimation methodology and key variables

To examine the impact of experience on product-destination spell survival we estimate the following random-effects complementary log-log model.[8]

$$h_{ik} = F(\beta' \mathbf{x}_{ik} + \gamma_k) \tag{4}$$

where h is the hazard rate, $\mathbf{x}_{ik}$ is a vector of time-varying covariates and γ_k is a function of time that allows the hazard rate to vary across time, and F(.) is the cloglog distribution function. We use the subscript i to denote firm-product-destination export spells. The dependent variable is a dummy equal to one for an ending spell. We treat spells as continuous and ignore breaks between them.

In addition to the experience measures and proximity discussed above, our variables include the following firm characteristics: size (measured by employment), productivity (measured by value added per worker) and total exports by the firm. A range of standard gravity variables at the destination country level are also included: distance from Ireland, contiguity, common language, GDP, GDP per capita. In addition we include and a dummy variable if the country is in the EU and a measure of the rule of law. We cluster the standard errors at the HS-6 level. The time dependence of the hazard is introduced as log(time) in all models to capture the decline in the hazard with time.

We estimate a number of different specifications to examine the overall effect of firm experience on the survival of new product-destination spells both in terms of the firm's existing export scope and also the length of time the firm has been an exporter. We will show that these baseline results are in line with existing evidence within this strand of literature. We then move to the main contribution of this paper which is to decompose the sources of experience into that coming from the firm's activities within a specific market and that coming from experience with a particular product.

Before using the direct measures of product and destination experience, we use two dummy variables to capture previous participation status. We first use a dummy for existing destination which is an indicator variable to capture if the firm has previously (i.e. before beginning the new product-market spell) exported in a destination or not. Similarly, the dummy for an existing product is an indicator of whether the firm has exported the product in question to other markets before entering the new product-destination combination.

Having used these dummy variables to identify if having any degree of experience in either the product or destination components of a new match has an effect on survival, we then use alternative measures of the extent of this experience. These are measured either by counts (of the existing markets and products) or by the number of years of experience a firm has built up in a particular market or product.

[8] See e.g., Hess and Persson (2012) for an overview of estimation methods in trade survival analysis.

3.2 Baseline results

Table 2 presents the results of our baseline model for overall experience levels and for the initial decomposition of experience using the dummy variables described above. The coefficients reported in all tables are exponentiated and, therefore, values over one indicate a negative relationship with export spell survival (positive effect on hazard of exit) and values below one indicate a positive effect on survival. Column (1) shows that experience measured by the number of existing export destinations or products that a firm has increases the probability of survival of a new product-market combination. This is consistent with the findings of Volpe-Martincus and Carballo (2009) and Görg et al. (2012). We also include a range of control variables at both the firm and market level. We find that similarity to the firm's existing range of export products (the proximity variable) has a strong positive effect on the survival of new export spells as previously documented by Goya and Zahler (2019) and Lawless and Studnicka (2019). Launching a new export relationship with a higher initial value is associated with larger probability of survival as expected. Somewhat surprisingly, the other firm characteristics included (employment and labour productivity) have negative effects on survival of individual export spells. This may be indicative of larger firms having a greater risk appetite in launching new export relationships.

Destination characteristics are largely in line with the standard results expected in a gravity model approach with distance increasing the exit hazard and GDP, EU membership and common language reducing it. Institutional quality, as proxied by the rule of law, do not have any effect on spell survival and neither do contiguity nor GDP per capita. The effects of these firm and country characteristics are stable across all specifications.

Column (2) introduces an alternative way of measuring firm experience through the number of years that a firm has been active in exporting. We find that the longer a firm has been an exporter, the lower the probability of survival of its newly established product-destination relationships. This negative effect of years of experience was also explored in Lawless and Studnicka (2019), who found that is was most likely due to firms moving away from their core competency as they spent more time as exporters. This explanation is consistent with models of multi-product firms such as Eckel and Neary (2010) where as product range increases, the new products are more marginal in terms of their value to the firm. Column (3) shows that the results are robust to combining the scope measures of export experience and the years spent as an exporter.

The next columns of Table 2 begin our decomposition of types of experience by including first a dummy variable for having previously exported to the same destination with other products before the launch of the product-destination combination being analysed. We then introduce a dummy variable for having previously exported the product in question to other markets. These two dummy variables are initially included separately along with overall firm experience and then in combination both with and without the overall firm experience variable to ensure that they are not reliant on its inclusion. The firm experience variable (number of years as an exporter) remains

essentially unchanged by the inclusion of the destination and product specific measures, keeping the previously observed negative effect on spell length.

The results for the dummy variables show that both destination and product experience when they are added separately in columns (4) and (5) shows that both are statistically significant in explaining the survival of a new product-destination combination but the positive effect of the product dummy is considerably larger in magnitude compared to that of the destination experience dummy. When both are included in the same specification (column 6), the positive effect of having exported the same product previously contributes significantly to increasing the probability of survival of the product-market trade relationship (or equivalently to reducing its hazard of exit). Prior experience with the destination on the other hand now reduces the survival chances of this new trade flow once the product experience is also controlled for.

A similar pattern is evident in the final column which further adds in the control for overall firm export experience. As before, this has the effect of reducing the survival probability of a specific new product-market flow. If the newly launched flow is with a product that the firm already exports elsewhere, this significantly improves the chances of it surviving in a new market. The same is not the case for having previous market experience which becomes statistically insignificant in this specification.

3.3 Separating the sources of experience

Having identified that the presence of destination and product experience have generally opposing effects on the success of a new product-destination pair, we next look at how the extent of these two different sources of experience affect the success of the relationship. In Table 3, we measure the experience that a firm has built up in a destination using the number of years the firm has already been exporting other products to this destination before the launch of the new product-destination pair. Likewise, we measure product experience as the length of time the product has been exported by the firm to other markets before it is launched in the new destination. We build up the specifications by introducing the length of destination experience in Column (1), continuing to control for the other firm and destination specific characteristics described in Table 2. Column (2) includes the effect of product experience length, after which Column (3) includes both measures simultaneously.

Each of these three specifications shows that building up experience in a destination has very different effects to building up experience in a product when it comes to the survival probabilities of a new product-destination pair. More time in a market has a significantly negative effect on the success of a new product being added to that market. In contrast, having exported a product (to other markets) for a longer period of time makes it significantly more likely to survive when launched in an additional destination. The remaining columns show that these differential effects of destination and product experience are robust to the inclusion of granular measures of the firm's export scope (numbers of existing destinations for each product and number of products for each destination), both of which increase the success probability of a new pair. Columns (4)

Table 2: Baseline results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Experience by firm		1.247***	1.255***	1.258***	1.311***		1.316***
		(0.007)	(0.007)	(0.007)	(0.026)		(0.028)
Number of destinations by firm	0.951***		0.942***				
	(0.006)		(0.006)				
Number of products by firm	0.915***		0.910***				
	(0.006)		(0.006)				
Existing destination dummy				0.960***		1.233***	0.984
				(0.011)		(0.013)	(0.019)
Existing product dummy					0.751***	0.829***	0.752***
					(0.016)	(0.007)	(0.016)
Initial value export flow	0.929***	0.938***	0.933***	0.937***	0.937***	0.934***	0.937***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.001)	(0.003)
Total firm exports	0.963***	0.927***	0.959***	0.927***	0.934***	0.936***	0.934***
	(0.003)	(0.002)	(0.003)	(0.002)	(0.005)	(0.002)	(0.005)
Proximity	0.476***	0.521***	0.498***	0.517***	0.563***	0.544***	0.561***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.020)	(0.008)	(0.019)
GDP	1.125	1.252**	1.230**	1.258**	1.276*	1.141	1.279*
	(0.117)	(0.130)	(0.128)	(0.130)	(0.174)	(0.118)	(0.175)
GDP per capita	0.942	0.870	0.882	0.869	0.857	0.922	0.857
	(0.104)	(0.096)	(0.097)	(0.096)	(0.108)	(0.101)	(0.108)
Contiguity	1.699	1.233	1.216	1.206	1.025	1.637	1.017
	(0.622)	(0.451)	(0.446)	(0.441)	(0.468)	(0.599)	(0.465)
Common language	0.389	0.234**	0.242**	0.232**	0.215**	0.359	0.214**
	(0.264)	(0.159)	(0.165)	(0.157)	(0.159)	(0.243)	(0.159)
Distance	1.310***	1.247***	1.247***	1.243***	1.233***	1.311***	1.232***
	(0.078)	(0.075)	(0.075)	(0.075)	(0.064)	(0.078)	(0.064)
Rule of law	0.956	0.957	0.953	0.959	0.954	0.952	0.954
	(0.049)	(0.049)	(0.049)	(0.049)	(0.052)	(0.049)	(0.052)
Employment	1.027***	1.012***	1.020***	1.012***	1.011	1.018***	1.011
	(0.004)	(0.004)	(0.004)	(0.004)	(0.012)	(0.004)	(0.012)
Productivity	1.041***	1.073***	1.069***	1.074***	1.075***	1.045***	1.076***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.011)	(0.005)	(0.011)
EU28	0.369***	0.366***	0.367***	0.366***	0.372***	0.375***	0.371***
	(0.037)	(0.037)	(0.037)	(0.037)	(0.048)	(0.038)	(0.048)
Constant	0.212***	0.216***	0.213***	0.217***	0.194***	0.193***	0.194***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.012)	(0.009)	(0.012)
Observations	191,742	191,742	191,742	191,742	191,742	191,742	191,742
Number of products (HS6)	3,252	3,252	3,252	3,252	3,252	3,252	3,252
Log likelihood	-112232	-111581	-111285	-111575	-111068	-112120	-111067

Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The table shows exponentiated coefficients. Dependent variable is a dummy equal to one when a spell ends. All continuous variables are in logs and all country-specific, time-variant variables are lagged one year. All specifications include controls for the current life length of the product-destination trade flow.

and (5) introduce these diversification measures separately for destination coverage and product coverage respectively, while column (6) includes all measures simultaneously. These results all suggest that, while there are benefits to overall export scale, experience in individual destinations and products do not necessarily follow the same pattern with product-related experience having a stronger link to export spell survival.

Table 3: Effects of length of destination and product experience

	(1)	(2)	(3)	(4)	(5)	(6)
Experience existing destination	1.129***		1.157***	1.160***		1.150***
	(0.005)		(0.012)	(0.005)		(0.010)
Experience existing product		0.960***	0.921***		1.036***	0.979**
		(0.004)	(0.011)		(0.012)	(0.010)
Number of destinations by product					0.708***	0.715***
					(0.008)	(0.008)
Number of products by destination				0.827***		0.814***
				(0.004)		(0.006)
Constant	0.210***	0.206***	0.197***	0.223***	0.138***	0.144***
	(0.010)	(0.010)	(0.012)	(0.010)	(0.010)	(0.010)
Observations	191,742	191,742	191,742	191,742	191,742	191,742
Number of products (HS6)	3,252	3,252	3,252	3,252	3,252	3,252
Log likelihood	-112060	-112424	-111870	-111177	-109070	-107785

Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The table shows exponentiated coefficients. Dependent variable is a dummy equal to one when a spell ends. All continuous variables are in logs. Please note that firm and country controls are included in all specifications (as in Table 2), but not reported here.

In Table 4, we examine the robustness of our experience measures by also including further indicators of the scale of the firm's export activity. These include a count of the number of existing destinations to which the firm exported a product before launching it in a new market and a count of the number of destinations to which a product is already exported by the firm before it is launched in the new destination. This shows that the differing directions of destination-specific and product-specific experience on new pair survival are robust to the inclusion of overall firm experience and varying count measures of products and destinations both at the firm-level and within products and destinations. The magnitude of the effect declines slightly in the final specification when all measures are included simultaneously but the effects remain highly significant.

3.4 Robustness check

A recurring concern in estimating firm level models of trade for Irish data is that the determinants of performance may differ considerably for Irish domestically-owned firms compared to those for foreign-owned multinational firms that dominate aggregate Irish export values. We test if this is a concern for our results by splitting the sample by nationality of ownership in Table 5. The key result remains unchanged with a negative

Table 4: Additional measures of firm export scale

	(1)	(2)	(3)
Experience by firm			1.181***
			(0.021)
Number of destinations by product		0.692***	0.702***
		(0.008)	(0.008)
Number of products by destination		0.776***	0.788***
		(0.006)	(0.007)
Experience existing destination	1.175***	1.138***	1.051***
	(0.005)	(0.010)	(0.009)
Experience existing product	0.928***	0.973***	0.939***
	(0.004)	(0.010)	(0.009)
Constant	0.193***	0.139***	0.141***
	(0.009)	(0.010)	(0.010)
Observations	191,742	191,742	191,742
Number of products (HS6)	3,252	3,252	3,252
Log likelihood	-111543	-107558	-107303

Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The table shows exponentiated coefficients. Dependent variable is a dummy equal to one when a spell ends. All continuous variables are in logs. Please note that firm and country controls are included in all specifications (as in Table 2), but not reported here.

effect of destination experience and positive effect of product experience on new match survival for both types of firm and across a range of alternative controls.

Table 5: Nationality

	(1)	(2)	(3)	(4)	(5)	(6)
	Irish			Foreign		
Experience existing destination	1.078***	1.078***	1.049***	1.240***	1.190***	1.042***
	(0.013)	(0.011)	(0.013)	(0.019)	(0.017)	(0.013)
Experience existing product	0.900***	0.942***	0.929***	0.943***	0.989	0.941***
	(0.012)	(0.010)	(0.011)	(0.015)	(0.014)	(0.012)
Number of destinations by firm	0.979	1.074***	1.072***	0.936***	1.065***	1.081***
	(0.016)	(0.015)	(0.015)	(0.019)	(0.016)	(0.015)
Number of products by firm	0.877***	1.052**	1.045**	0.921***	1.142***	1.145***
	(0.016)	(0.022)	(0.022)	(0.018)	(0.023)	(0.023)
Number of destinations by product		0.684***	0.688***		0.702***	0.714***
		(0.011)	(0.012)		(0.010)	(0.010)
Number of products by destination		0.767***	0.772***		0.779***	0.793***
		(0.009)	(0.009)		(0.009)	(0.009)
Experience at firm level			1.063***			1.311***
			(0.018)			(0.035)
Constant	0.230***	0.166***	0.166***	0.246***	0.176***	0.181***
	(0.017)	(0.014)	(0.014)	(0.017)	(0.015)	(0.015)
Observations	73,885	73,885	73,885	117,770	117,770	117,770
Number of products (HS6)	2,857	2,857	2,857	2,774	2,774	2,774
Log likelihood	-41230	-40084	-40068	-68999	-66582	-66269

Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The table shows exponentiated coefficients. Dependent variable is a dummy equal to one when a spell ends. All continuous variables are in logs. Please note that firm and country controls are included in all specifications (as in Table 2), but not reported here.

4 Conclusion

Building up experience as an exporter has been shown to help a firm enter and survive when it expands into new markets. This paper digs more deeply into the sources and effects of firm experience at a more granular level than the existing literature. We look at the survival of export flows for a firm in each product-destination pairing and find that the effects of experience on survival depend critically on the source of this experience. Our central result is that at the launch of a new product-market combination, having built up previous experience in the product is a strong predictor of success of the new pairing but prior experience in the market has the opposite effect, actually increasing the probability of exit.

Although the finding that sources of experience operate in different ways initially appear surprising, the patterns are consistent with a number of the features of models of multi-product firms as exporters that expand their number of products in a particular market, they do so by moving away from their core expertise and launching more marginal products.

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Appendix

Table A1: Correlation matrix

	Exper. by firm	# dest. by firm	# products by firm	Exper. exist product	Exper. exist dest.	# dest. by product	# products by dest.
Exper. by firm	1						
# dest. by firm	0.0432*	1					
# products by firm	0.1582*	0.5777*	1				
Exper. exist product	0.6038*	0.1365*	0.1218*	1			
Exper. exist dest.	0.7862*	0.0953*	0.2477*	0.3693*	1		
# dest. by product	-0.121*	0.5861*	0.209*	0.1193*	-0.1636*	1	
# products by dest.	0.0959*	0.1439*	0.5627*	-0.0870*	0.2290*	-0.1390*	1

* Indicates significance at 1% level.

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