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Unlocking the Potential of Immigrant Exporters: Digital Resources as a Catalyst for Scalability and International Success

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EXECUTIVE SUMMARY

Immigrant-owned small and medium-sized enterprises (SMEs) contribute significantly to trade and innovation in the Asia-Pacific Economic Cooperation (APEC) region. These businesses often exhibit a higher export intensity than their non-immigrant counterparts, reflecting their entrepreneurial ambition and commitment to international markets. However, they often struggle to scale their export activities, limiting their contribution to the burgeoning digital economy. This study examines the performance gap between immigrant and non-immigrant exporters with high export intensity, emphasizing the role of digital resources. We argue that immigrant exporters are particularly susceptible to a network scalability problem, where the costs of maintaining informal social networks across national borders outweigh the growth-related benefits.

Building on previous research emphasizing the growth aspect of scaling, especially among immigrant businesses, we deliberately focus on risk-adjusted profitability to highlight another relevant dimension of scalability. Scalability is not just about whether a firm grows rapidly. More crucially, it must achieve increasing returns to scale in input-output relationships, where revenue grows faster than costs as the firm expands. Consequently, the growth dimension is intricately tied to the profitability dimension. Notably, although prior research shows that immigrant exporters can outperform other SMEs in revenue growth, they remain, on average, smaller than SMEs with Canadian-born owners. Since immigrant-owned SMEs also face limited access to external equity finance, the need to finance expansion through retained earnings makes low or unstable profitability a potentially binding constraint on their scalability. By also conceptualizing cost inefficiencies associated with their network scalability problem, our focus on risk-adjusted profitability allows us to quantify a lead indicator of their scalability potential before long-term growth or decline materializes.

Analyzing a sample of 7,723 Canadian SMEs, we confirm that the returns to high export intensity are lower for immigrant exporters. However, this performance gap can close and even reverse when they leverage significant digital resources. These findings indicate that co-ordinated trade, immigration and digital policies — e.g., the trade-immigration-digital (TID) policy nexus — can foster trade flows and inclusive economic growth within Canada and, by extension, in other APEC economies facing comparable immigrant entrepreneurship and trade dynamics.

Although this study is grounded in Canadian data, the findings offer suggestive lessons for the broader APEC context, where immigrant-owned SME exporters face similar digitalization challenges. Addressing the digital divide within APEC economies may be important to realizing this economic potential, especially as digital trade intensifies. Where analogous conditions exist, APEC members could consider integrating trade, business immigration and digital priorities; for instance, minimizing trade and business migration barriers without compromising national security. Another priority is making affordable digital training, technologies and infrastructure available to immigrant and other less-established exporters.

By collaborating on these priorities, APEC members can appropriately develop and implement transformational agreements that incentivize immigrant-owned SMEs to innovate and scale profitably and globally. These outcomes can close existing performance gaps between immigrant and non-immigrant businesses, making entrepreneurship an effective means to broadly shared prosperity and upward mobility. Ultimately, immigrant-owned companies and the broader SME sector could be transformed into engines of innovation and growth in regional and global economies.

THE CHALLENGE: EXPORT PERFORMANCE GAPS IN IMMIGRANT-OWNED SMES

Immigrant-owned businesses are recognized as significant contributors to international trade and economic growth in developed countries (Cardoso and Ramanarayanan 2022; Kerr 2018; Kerr and Kerr 2020; Saxenian 2002). These firms often exhibit a strong export orientation, potentially driving trade flows through high international sales (Fung, Grekou and Liu 2019). This orientation partially reflects immigrant owners' enhanced access to personal networks of foreign connections compared to their non-immigrant counterparts (Czinkota, Khan and Knight 2021; Sui, Morgan and Baum 2015). However, a network scalability problem can arise if the economic benefits of these informal social networks grow more slowly than their associated real costs, such as the time and energy required to maintain them for economic and social purposes. This challenge is particularly salient in digital trade (OECD 2023), where the scale, scope and speed of trade have expanded dramatically, requiring businesses to adapt rapidly and efficiently. Whether digital resources can mitigate these scalability challenges and close performance gaps between immigrant and non-immigrant exporters remains a pressing question.

There is a lack of theoretical insights into how network scalability issues may inhibit financial performance and how digital resources might address these barriers. Conceptually, scalability goes beyond accelerated firm growth. More crucially, it must achieve increasing returns to scale in input-output relationships, where revenue grows faster than costs as the firm expands (Bohan, Tippmann et al. 2024). Consequently, the growth dimension depends on the profitability dimension. Furthermore, having high or stable profitability can be essential for financing business expansion with retained earnings when firms have limited access to external equity finance (St-Pierre, Sakka and Bahri 2018). Thus, if immigrant owners receive proportionally less external capital, whether because they are less likely to seek it or because specific barriers result in lower approval rates (Ostrovsky, Picot and Leung 2019), having low or unstable profitability will particularly undermine their potential to accumulate retained earnings for scaling export activity. Meanwhile, cost inefficiencies from the network scalability problem can reduce risk-adjusted profitability. Thus, focusing on risk-adjusted profitability can help us infer the scalability potential of immigrant exporters before we observe their long-term growth performance.

To consistently operate profitably, immigrant exporters must generate stable revenues that exceed trade costs. The prevailing wisdom suggests that elevated trade costs impede cross-border trade flows (Anderson and van Wincoop 2004). By leveraging trusted informal social networks, immigrant entrepreneurs can reduce trade costs and frictions, such as information-gathering costs and contracting issues. For example, Parsons and Vézina (2018) provide causal evidence linking historical differences in U.S.-Vietnam trade flows across states to variations in their Vietnamese populations. Moreover, micro-level evidence indicates that immigrant-owned SMEs in developed countries such as Canada achieve higher export intensity than their non-immigrant peers (Morgan, Sui and Baum 2021; Sui, Morgan and Malhotra 2015).

However, other research suggests that immigrant networks may be associated with cost inefficiencies, manifest in the network scalability problem, that undermine their relative financial returns to exporting. Specifically, while immigrant exporters can grow their revenues faster than their non-immigrant peers (Neville, Orser, Riding et al. 2014), this growth is likely less sustainable for two reasons. First, there is evidence that immigrant businesses are generally smaller than the average business with Canadian-born owners; and second, they tend to realize lower financial returns to exporting than their non-immigrant counterparts (Morgan, Sui and Baum 2018). A more recent Global Affairs Canada (GAC) report corroborates and extends this picture (Blanchet 2021).

Notably, this GAC report finds that immigrant-led SMEs in Canada had an export propensity of 14.3 per cent in 2017, compared with 10.8 per cent for Canadian-born-and-led SMEs and that the number of immigrant-led SME exporters grew at nearly twice the rate of their Canadian-born counterparts between 2014 and 2017 (26.5 per cent vs. 13.7 per cent). It also finds that immigrant-led SMEs tend to operate in higher proportions in export-intensive sectors and export to more diverse global markets, relying less on the United States. At the same time, this report similarly documents that immigrant-led SMEs are on average smaller than SMEs led by Canadian-born individuals, even though their owners are highly educated and report higher rates of technology adoption.

Thus, our investigation of digital resources can add to previous research on immigrant SME exporters by clarifying whether these resources can help close the profitability gap when their export intensity is high. If immigrant owners' informal social networks drive international sales but simultaneously undermine profitability, failing to address this paradox leaves a critical gap in understanding key international performance drivers. As digital technologies reshape trade patterns and create new opportunities for businesses to connect with global markets (Birkinshaw 2022; Forman and van Zeebroeck 2019; OECD 2021; Zahra, Liu and Si 2023), it is essential to investigate how digital resources can offset these challenges and unlock new efficiencies.

These challenges in the Canadian context are particularly relevant for member countries in the Asia-Pacific Economic Cooperation (APEC) region with comparable immigrant entrepreneurship and trade dynamics. Recent estimates indicate that the region's SMEs represent over 97 per cent of all businesses and significantly contribute to economic growth and job creation (APEC 2024). Meanwhile, the 21 APEC member economies accounted for 49 per cent of world trade and 60 per cent of global economic output in 2023 (Prime Minister of Canada 2024). In this context, the SME sector comprises a vital but under-utilized component of the region's export ecosystem. Furthermore, immigrant-owned SMEs' international orientation and unique challenges set them apart from other SMEs. This paper examines how digital resources can alleviate these challenges, drawing lessons from Canadian SMEs with policy implications extending to the broader APEC region. By addressing the gap in financial performance between immigrant and non-immigrant exporters, APEC member economies can collaboratively establish priorities and initiatives to foster inclusive and sustainable economic growth.

UNPACKING THE BARRIERS: THE NETWORK SCALABILITY PROBLEM

The international economics literature has long recognized trade costs as impediments to cross-border trade flows (Anderson and van Wincoop 2004). Trade costs encompass a wide array of economic and non-economic costs associated with conducting business across borders, ranging from transportation and regulatory expenses to information acquisition, contract enforcement and overcoming cultural barriers (Brancaccio, Kalouptsi and Papageorgiou 2020; Choi and Choi 2014; Duranton and Storper 2008; Gokmen 2017; Kónya 2006). From an economic sociology perspective (Granovetter 1985, 2017), these challenges can be viewed through a network embeddedness lens. Firms face a potential network disadvantage stemming from deficiencies in two key forms of embeddedness: structural embeddedness, which refers to the extent of an individual's connections within a network, often forged through memberships in groups, organizations or communities; and relational embeddedness, which involves deeper, dyadic connections built through repeated and close interactions between individuals, fostering trust and reciprocity (Ozdemir, Moran, Zhong et al. 2016).

Both forms of embeddedness are essential for establishing and sustaining a robust network that can facilitate international trade. Structural embeddedness, often involving weaker ties, provides access to diverse information and new opportunities (Granovetter 1973; Ozdemir, Moran, Zhong et al. 2016). Joining industry associations or attending trade fairs exemplify how firms can enhance structural embeddedness. On the other hand, relational embeddedness, characterized by stronger ties, is crucial for accessing valuable resources such as strategic advice, tacit knowledge, endorsements and favourable financing (Ozdemir, Moran, Zhong et al. 2016). These strong ties, built through frequent interaction and trust-building, are significant for navigating the complexities of foreign markets. Therefore, firms can mitigate trade costs by strategically cultivating structural and relational embeddedness within cross-border business networks.

Building and maintaining such embeddedness can be challenging, especially for SMEs with limited resources and experience. However, immigrant exporters may have an inherent advantage due to their owners' pre-existing personal networks in their countries of origin or other foreign markets. Evidence supports this advantage, showing the strong export orientation of immigrant-owned SMEs (e.g., Sui, Morgan and Baum 2015). Additionally, studies have found a positive association between immigrant communities and increased bilateral trade or reduced trade costs (e.g., Parsons and Vézina 2018; Tadesse and White 2017).

While immigrant exporters may benefit from lower trade costs due to their network advantage, relying heavily on personal networks can create a potential drawback: costly relational embeddedness. Maintaining these informal social networks can demand significant time and resources, with a disproportionate share of the non-economic benefits (e.g., emotional and social support) (Boccagni 2015; Bryceson 2019; Fenoll and Kuehn 2018). This can lead to a network scalability problem, where the costs of maintaining these networks rise faster than the business benefits they generate. This scalability challenge is likely more acute for immigrant exporters than their non-immigrant counterparts. The former often rely more heavily on these resource-intensive, relationally embedded networks for foreign market activities. For example, the more frequently they socialize with their relatives, friends and diasporans abroad, the easier it could be to mobilize informal social support. However, this support could come with few concrete benefits for accelerating export sales cost-effectively. Consequently, their returns to high export intensity may be lower due to the increasing costs of scaling these networks.

THE ROLE OF DIGITAL RESOURCES IN BRIDGING THE GAP

Based on the digital economics literature (e.g., Goldfarb and Tucker 2019), we posit that digital resources can solve the network scalability problem. Digital resources encompass a broad spectrum of information and communication technologies (ICT), including readily available tools like phone calls, email, video conferencing, websites, social media, mobile devices and enterprise resource planning (ERP) systems (Brynjolfsson, Rock and Syverson 2019; Fitzgerald, Kruschwitz, Bonnet et al. 2014; Morgan and Ngwenyama 2015; Nambisan 2017). These conventional digital resources are more accessible and affordable for young and small firms than advanced technologies like artificial intelligence, blockchain and the Internet of Things (IoT).

Crucially, digital resources can reduce search and transaction costs, facilitate market access and enable more scalable cross-border co-ordination (Forman and van Zeebroeck 2019; López González and Ferencz 2018; OECD 2023). In our empirical setting, this construct is measured using the SFGSME's (Statistics Canada 2011) directly reported new ICT expenditures (computers, communications and software) and firms' total sales in 2011, allowing us to construct an ICT spending intensity measure. The SFGSME also reports the share of total sales made outside Canada (export sales share) in 2011, enabling us to link ICT investment intensity to export intensity and to test whether digital resources mitigate the performance disadvantage of immigrant-owned firms at high export intensity.

INSIGHTS FROM CANADIAN SMES: DATA AND KEY PATTERNS

DATA

This study combines survey and administrative data. Our primary survey source is Statistics Canada's 2011 Survey on Financing and Growth of Small and Medium Enterprises (SFGSME). Besides the data mentioned above, the SFGSME captures owner/manager characteristics, including place of birth. Importantly, the SFGSME contains direct firm-level measures of both new ICT expenditures and export sales share in 2011, which enables us to connect our conceptual discussion of digital resources to the survey-based export-intensity measure used in the empirical analysis.

The 2011 SFGSME is linked to Statistics Canada's T2-LEAP administrative panel, allowing us to observe annual profits and assets over 2010–2015 for the same firms. Unless otherwise noted, all explanatory variables and controls are measured in the survey year (2011). Our profitability outcome is constructed from administrative ROA information over 2011–2015, and we include an initial performance control measured in 2010. After applying our linkage and completeness criteria, the analysis sample includes 7,723 SMEs, of which 1,208 (15.6 per cent) are immigrant-owned.

Importantly, the SFGSME contains direct measures of export sales and new ICT expenditures, which allow us to connect our conceptual discussion of digital resources to firm-level evidence on export behaviour and performance. The estimation sample is anchored in the 2011 survey year: immigrant ownership, export intensity, digital resources, owner characteristics, firm size, firm age, R&D and equity finance are constructed from the 2011 SFGSME, while profitability is constructed from linked T2-LEAP data over 2011–2015 and initial performance is measured in 2010.

This study should be read alongside Blanchet's (2021) Global Affairs Canada report on immigrant-led SME exporters. Blanchet (2021) draws on later waves of the same Statistics Canada SFGSME program (notably 2017, with descriptive comparisons over 2014–2017) to document that immigrant-led SMEs are more likely to export, export to more diverse markets and report higher rates of technology adoption despite being smaller on average. Our study complements this

evidence by using the 2011 SFGSME linked to longitudinal administrative financial data to test in a regression framework whether digital resources mitigate the performance gap faced by immigrant-owned firms at high export intensity.

VARIABLES

Variable timing and sources are as follows. Unless stated otherwise, all independent variables and controls are measured in 2011 using the SFGSME. Export intensity is measured directly from the SFGSME as the percentage of total sales made outside Canada (export sales share) in 2011. To capture scalability in a financially meaningful way, our primary dependent variable is risk-adjusted profitability, constructed from linked administrative data (T2-LEAP) as the mean return on assets (ROA) divided by the standard deviation of ROA over 2011–2015 (Morgan, Sui and Baum 2018). Annual ROA is defined as annual profits divided by total assets.

Our secondary dependent variable, export intensity, is derived directly from the 2011 SFGSME and is measured as export sales divided by total sales in 2011 (Kiss, Fernhaber and McDougall-Covin 2018; Sui, Baum and Malhotra 2019). Based on a comprehensive study that reviewed 43 empirical studies between 1998 and 2004, Sousa (2004) concluded that export intensity is the most used variable to measure export performance.

Our primary explanatory variables are a firm's digital resources and immigrant ownership. In the SFGSME, digital resources are observed through firms' reported new ICT expenditures — computers, communications and software — which provide a direct survey-based indicator of their investment in basic digital infrastructure. As Neirotti, Raguseo and Paolucci (2018) suggest, firms that spend a higher proportion of their income on ICT are demonstrating more basic digital resources. Based on prior research (e.g., Symeonidou, Leiponen, Autio et al. 2022; Underwood and Khosrowshahi 2012), we calculated digital resources as the percentage of new ICT expenditure (i.e., spending on computers, communications and software) to total sales.¹ We also recognize that the resources devoted to acquiring digital resources vary significantly across different industries (Verhoef, Broekhuizen, Bart et al. 2021). Therefore, we weighted a firm's digital resources to its corresponding industry average (derived from the entire sample of SFGSME) when we calculated this variable (Huyghebaert and Luybaert 2013). In line with Morgan, Sui and Baum (2018), our second explanatory variable, Immigrant, is a dummy variable that equals one if a firm's majority owner or manager was not born in the host country (Canada in our case) and zero otherwise.

Based on prior research, we controlled for owner-specific and firm-specific variables that might affect firms' export intensity and profitability. Owner-specific control variables include owners' gender and business experience. Besides immigrant ownership, a recent study by Expósito, Sanchis-Llopis and Sanchis-Llopis (2022) has suggested that business owners' gender and business experience influence firms' export performance. Therefore, we controlled for women-owned, which is a dummy variable that equals one if a company is women majority-owned and zero otherwise. Business experience is measured as the business owner or general manager's years of experience in having or owning a business.

Firm-specific control variables include firm size, age, R&D, equity finance and initial performance. Firm size and age are important determinants of their export performance (Bhat and Momaya 2020). In line with previous studies (i.e., Sandberg, Sui and Baum 2019), firm size is calculated as the natural logarithm of the number of employees reported in 2011. Firm age is measured as the

¹ We also measured digital resources as new ICT expenditure per employee. The results are consistent across the two measures..

number of years the firm had been in operation as of 2011. R&D investment is critical in firms' export behaviour (Falk and de Lemos 2019) and performance (Davicik, Cardinali, Sharma et al. 2021). R&D is calculated as the natural logarithm of the company's research and development expenditures in 2011. Therefore, the higher mean reported later for immigrant-owned firms should be interpreted as higher average R&D spending, not as a percentage-point difference. Access to external sources of finance, such as equity finance, is critical for firms' export performance (St-Pierre, Sakka and Bahri 2018). Therefore, we controlled for equity finance, a dummy variable that equals one if a firm has access to equity finance and zero otherwise. As a firm's subsequent financial performance depends in part on its initial condition, we controlled for initial performance, measured as profit divided by total sales in 2010 using the linked T2-LEAP administrative data. Finally, in line with prior studies (i.e., Cassetta, Monarca, Dileo et al. 2020), we included industry sector (i.e., retail trade, wholesale trade, transportation and professional services) and macro-regional-level (Atlantic, Prairies, British Columbia, Ontario and Quebec) dummy variables to control for the impact of environmental factors on firms' export and financial performance.

STATISTICAL METHODS

Several studies have suggested that firms' export intensity and digital resources are strategic choices and endogenous to their resources and capabilities (e.g., Sun, Deng and Wright 2021; Sui, Morgan and Baum 2022). Given such concerns, we used a two-stage instrumental variable approach to control for potential endogeneity such as self-selection and omitted variables concerning a firm's export intensity and digital resources (Reeb, Sakakibara and Mahmood 2012).

Export intensity is a number bounded between zero and 1. Therefore, we used a Tobit model in the first stage to estimate a firm's export intensity. We used the language of the majority owner or general manager as an instrumental variable to control for the potential endogenous effect of export intensity on financial performance. Specifically, language is a set of dummy variables (i.e., English, French and other languages) that indicates the language the majority owner or general manager first learned at home and still understands today.

Since our digital resources variable is a continuous one, we used linear regression in the first stage of analysis. We used the education of the majority owner or general manager as an instrumental variable to control for the potential endogenous effect of digital resources on financial performance. Specifically, education is a set of dummy variables (i.e., primary, high school, college, bachelor's and master's degrees) that indicates the highest level of education the majority owner or general manager has achieved.

In the second stage, we used the linear regression model to estimate profitability because it is a continuous variable. The Durbin (1954) and Wu-Hausman (Wu 1974; Hausman 1978) statistics indicate that treating digital resources and export intensity as endogenous variables is appropriate. The Cragg-Donald F-statistics are significant at the one-per-cent level, rejecting the null hypotheses of weak instruments (Cragg and Donald 1993). We also applied the Sargan (1988) test to ensure the selected instruments were appropriate.



RESULTS

Results are presented in a staged manner. Table 1 reports descriptive differences between immigrant-owned and non-immigrant-owned SMEs. We then report first-stage models for the two potentially endogenous strategic variables in our framework: digital resources (Table 2) and export intensity (Table 3). Finally, Table 4 presents the core profitability analysis. Across all regression models, non-immigrant-owned firms constitute the comparison group (Immigrant = 0), and interaction terms are interpreted as differential slopes and/or different marginal returns relative to that baseline group.

Table 1 compares immigrant-owned and non-immigrant-owned firms in our 2011 sample. Relative to non-immigrant-owned firms, immigrant-owned firms exhibit higher export intensity (0.10 vs. 0.05), higher digital resources (1.19 vs. 1.02) and higher mean logged R&D expenditure (1.53 vs. 1.31), while also being smaller and younger on average. We interpret the R&D difference as evidence that immigrant-owned firms in our sample are, on average, higher R&D expenditure. These descriptive patterns are broadly consistent with Blanchet's (2021) later-wave GAC evidence from the same survey program, which shows that immigrant-led SMEs are smaller on average but display higher export propensity and somewhat stronger innovation- and technology-related indicators than Canadian-born-and-led SMEs.

Table 1. Comparison Between Immigrant-Owned and Non-Immigrant-Owned Firms

Variables	Immigrant-owned	Non-immigrant- owned	Mean values are statistically different at the 5% level?
Observations	1,208	6,515	
Profitability	4.19	4.82	Yes
Export intensity	0.10	0.05	Yes
Digital resources	1.19	1.02	Yes
Initial performance	0.53	0.54	No
Women-owned	0.12	0.11	No
Business experience	21.57	22.17	No
Firm size	2.15	2.34	Yes
R&D	1.53	1.31	Yes
Equity finance	0.09	0.10	Yes
Firm age	21.36	24.65	Yes

N = 7,723

These descriptive patterns are consistent with those documented by the previously discussed GAC report (Blanchet 2021) based on 2017 SFGSME data: immigrant-led SMEs are smaller (60.8 per cent are micro-enterprises vs. 52.9 per cent for Canadian-born-and-led firms) yet have higher export propensity and are more likely to hold intellectual property and report innovation. The GAC report also finds that immigrant SME leaders are considerably more educated than their Canadian-born counterparts, with 34.2 per cent of the former holding a bachelor's degree vs. 22.6 per cent of the latter. It also documents that immigration policy changes since 1993 favouring IT- and engineering-trained applicants may help explain the higher technology adoption rates among immigrant entrepreneurs. This is consistent with our finding that immigrant-owned firms invest more in digital resources despite being smaller and reinforces the plausibility of digital resources as a scalability lever for this group.

We now turn to our preliminary regression analyses that support the primary performance analysis. Table 2 reports the results of the linear regression analysis on digital resources. It shows that firms with more educated and experienced owners are likelier to have many digital resources. When firms that are smaller, younger, have less equity finance and are more R&D-intensive, they also tend to work with more digital resources. Furthermore, firms with non-immigrant and women owners are more likely to devote resources to digital resource acquisition. This is also consistent with the descriptive comparison in Table 1: immigrant-owned firms report higher average R&D expenditure and the positive R&D coefficient in Table 2 suggests that more R&D-intensive firms also devote more resources to digital infrastructure.

Table 2. Determinants of Digital Resource Acquisition

Variables	Coefficient	Standard error
Immigrant	-0.092***	(0.016)
Initial performance	0.101***	(0.015)
Women-owned	0.086***	(0.019)
Business experience	0.004***	(0.000)
Firm size	-0.019***	(0.007)
R&D	0.153***	(0.002)
Equity finance	-0.037***	(0.001)
Firm age	-0.004***	(0.000)
Education (base category: primary school)		
High school	0.313***	(0.025)
College	0.522***	(0.024)
Bachelor's	0.668***	(0.026)
Master's	0.621***	(0.029)
Constant	0.471***	(0.037)
Location dummies	Yes	
Industry dummies	Yes	
Observations	7,723	
Adjusted R ²	0.225	

Note: *p < 0.10, **p < 0.05, ***p < 0.01. Standard errors are in parentheses.

Table 3 presents the Tobit results for export intensity. Model 1 estimates the baseline association of immigrant ownership and digital resources with export intensity, with non-immigrant-owned firms as the comparison group. Both immigrant ownership (0.176, p < 0.001) and digital resources (0.364, p < 0.001) are positively associated with export intensity. Model 2 adds the immigrant × digital resources interaction. The coefficient on this term is positive and significant (0.146, p < 0.001), indicating that the positive association between digital resources and export intensity is stronger for immigrant-owned than for non-immigrant-owned firms.

Table 3. Impact of Immigrant Ownership and Digital Resources on Export Intensity

Variables	Model 1	Model 2
Immigrant	0.176*** (0.005)	0.038*** (0.004)
Digital resources	0.364*** (0.007)	0.297*** (0.023)
Immigrant × Digital resources		0.146*** (0.014)
Initial performance	-0.088*** (0.006)	-0.088*** (0.006)
Women-owned	-0.224*** (0.006)	-0.224*** (0.006)
Business experience	-0.001*** (0.000)	-0.001*** (0.000)
Firm size	0.067*** (0.002)	0.067*** (0.002)
R&D	-0.050*** (0.002)	-0.050*** (0.002)
Equity finance	0.027*** (0.001)	0.027*** (0.001)
Firm age	0.000 (0.000)	0.000 (0.000)
Owner's language (base: Other languages)		
English	0.109*** (0.006)	0.109*** (0.006)
French	-0.075*** (0.007)	-0.076*** (0.007)
Constant	-0.696*** (0.010)	-0.696*** (0.010)
Location dummies	Yes	Yes
Industry dummies	Yes	Yes
Log-likelihood	-124,593	-124,522
Pseudo R ²	0.29	0.30

Note: N = 7,723. *p < 0.10, **p < 0.05, ***p < 0.01. Standard errors are in parentheses. The digital resources variable is standardized.

Turning to our primary analysis, Table 4 reports the linear regression analysis of profitability.² Model 2 adds the export intensity × digital resources interaction, which is positive and significant (0.088, p < 0.001), indicating that digital resources strengthen the profitability returns to export intensity across firms overall. Model 3 then adds the immigrant-related interaction terms. The negative export intensity × immigrant coefficient (-0.119, p < 0.001) shows that, relative to non-immigrant-owned firms, immigrant-owned firms earn lower financial returns to high export intensity. However, the positive immigrant × digital resources coefficient (0.260, p < 0.001) and the positive three-way interaction among immigrant ownership, digital resources and export

² Digital resources and export intensity are standardized to make it easier to understand the relative importance of these two different predictors.

intensity (0.117, $p < 0.001$) indicate that digital resources mitigate — and can potentially reverse — this disadvantage. In substantive terms, the profitability gap between immigrant- and non-immigrant-owned firms narrows as digital resources increase.

Table 4. Impact of Immigrant Ownership, Digital Resources and Export Intensity on Risk-Adjusted Profitability

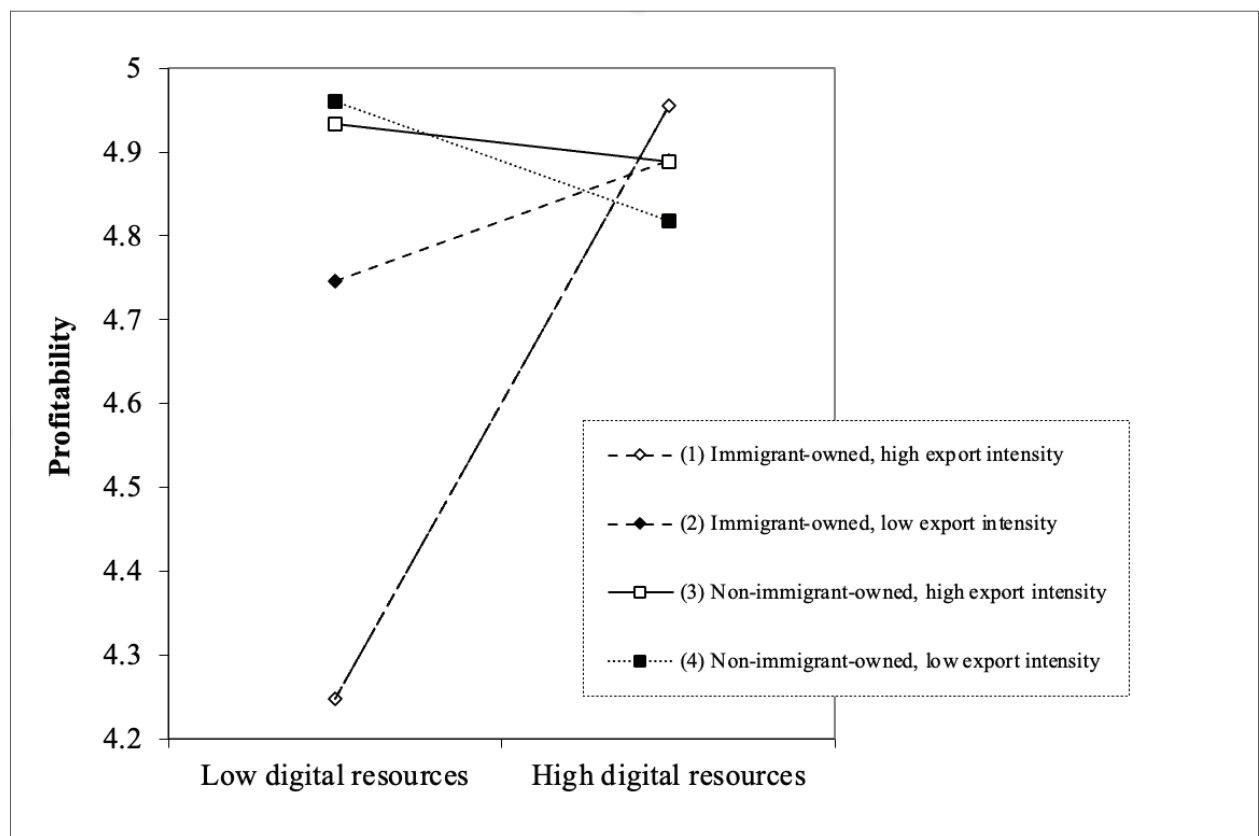
Variables	Model 1	Model 2	Model 3
Export intensity (EI)	0.063*** (0.024)	-0.060** (0.026)	0.011 (0.028)
Immigrant	-0.166*** (0.017)	-0.135 (0.094)	-0.190*** (0.020)
Digital resources	-0.072** (0.028)	0.059* (0.031)	-0.047 (0.032)
EI x Digital resources		0.088*** (0.008)	0.024*** (0.009)
EI x Immigrant			-0.119*** (0.019)
Immigrant x Digital resources			0.260*** (0.021)
Immigrant x Digital resources x EI			0.117*** (0.014)
Women-owned	0.180*** (0.021)	0.138*** (0.021)	0.152*** (0.021)
Business experience	0.005*** (0.001)	0.005*** (0.001)	0.005*** (0.001)
Firm size	0.492*** (0.008)	0.505*** (0.008)	0.500*** (0.008)
Firm age	0.015*** (0.000)	0.015*** (0.000)	0.015*** (0.000)
Initial performance	0.776*** (0.016)	0.766*** (0.016)	0.769*** (0.016)
R&D	-0.024*** (0.006)	-0.060*** (0.007)	-0.049*** (0.007)
Equity finance	0.129*** (0.002)	0.135*** (0.002)	0.134*** (0.002)
Constant	1.149*** (0.029)	1.140*** (0.029)	1.146*** (0.030)
Adjusted R ²	0.290	0.278	0.309

Note: N = 7,723. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are in parentheses. Digital resources and export intensity are standardized. Industry and location dummies are included.

Following the suggestions by Dawson and Richter (2006) on probing three-way interactions, we plotted the moderating effects of immigrant ownership and export intensity on the relationship between digital resources and profitability. As Figure 1 shows, when firms are immigrant-owned and have high export intensity, a higher digital resource level is associated with the highest increase in profitability. When firms are immigrant-owned and have low export intensity, a higher digital resource level is associated with a moderate increase in profitability. When firms are non-immigrant-owned and have high export intensity, a higher digital resource level is associated

with a slight decrease in profitability. When firms are non-immigrant-owned and have low export intensity, a higher level of digital resources is associated with a moderate reduction in profitability. These results remain consistent with Table 4, Model 3, that when firms are immigrant-owned and have high export intensity, higher digital resource levels are associated with higher financial returns.

Figure 1. Digital Resources and Profitability: Moderating Effects of Immigrant Ownership and Export Intensity



POLICY IMPLICATIONS FOR INCLUSIVE DIGITAL ADOPTION

Our findings have significant implications for policymakers with an inclusive trade and economic growth mandate in the digital age. Notably, the policy implications discussed below are grounded directly in our empirical results for Canadian SME exporters. We provide them as illustrative directions for APEC economies with comparable immigrant entrepreneurship and trade dynamics rather than as APEC-wide prescriptions. This caveat is vital because a more extensive analysis across APEC member economies is needed to draw more generalizable policy implications. While recognizing immigrant exporters' potential, we have emphasized network scalability constraints that limit their ability to expand and compete effectively in global markets. Addressing these challenges requires targeted policies and programs to incentivize digital technology adoption among immigrant-owned businesses. Initiatives such as providing tailored training programs to enhance digital literacy and skills, offering financial support or tax incentives for ICT investments and expanding digital infrastructure to facilitate international trade are essential. By adopting these measures, policymakers can empower immigrant exporters to leverage digital tools that



mitigate scalability challenges and enhance their ability to scale their export operations efficiently.

The design of such programs should be informed by the distinct barriers immigrant-led SMEs face. Unlike Canadian-born-and-led SMEs, which most commonly cite logistical obstacles to exporting (7.1 per cent of non-exporters), immigrant-led SMEs are more likely to identify financial risk (6.5 per cent) and inadequate cash-flow (4.6 per cent) as their primary barriers to exporting (Blanchet 2021). This suggests that bundling financial access programs and digital resources (e.g., export credit guarantees, working capital loans tailored to SMEs and targeted ICT investment subsidies) may be especially effective for immigrant-owned firms, a policy direction consistent with our finding that digital resources are associated with stronger financial returns to high export intensity for this group.

National Initiatives like the Canadian government's Canada Digital Adoption Program (CDAP), announced in Budget 2021 and launched in March 2022, which allocated \$4 billion to accelerate digital adoption among less-established firms, exemplify the potential of such targeted interventions (ISED 2022). Our findings affirm the importance of similar programs in advancing national export promotion priorities and emphasize their relevance in the post-COVID-19 global economy, where digital trade has emerged as a critical driver of economic resilience and growth (Zahra 2021). Expanding and adapting such programs to meet the specific needs of immigrant entrepreneurs can further enhance their impact.

The urgency of this agenda is reinforced by recent evidence on Canada's digital trade trajectory. Statistics Canada (2024) reports that 54 per cent of Canada's commercial services exports were digitally delivered in 2022. However, Export Development Canada's Economic and Political Intelligence Centre finds that Canada's share of global digitally delivered service exports has been declining since 2020, driven by losses in R&D, engineering and audio-visual services (Sharma and Farrell 2026). The 54 per cent denominator is COMMERCIAL SERVICES EXPORTS in 2022, not total exports of goods and services. This correction is based on Statistics Canada's original release, rather than the EDC article's abbreviated wording. Most strikingly, while ICT and professional services grew approximately 27 per cent globally between 2022 and 2024, Canada contracted by 1.4 per cent in those same categories over the same period. This EDC analysis attributes Canada's digital trade competitiveness to its skilled workforce and creative capabilities rather than to digital-driven infrastructure or platform-based business models. This is precisely the human capital dimension that immigrant entrepreneurs with higher education and technology adoption rates are well-positioned to leverage.

In addition to promoting digital adoption, building a robust digital trade infrastructure is vital. Investments in high-speed internet access, particularly in under-served regions with significant immigrant entrepreneurial activity, are critical for ensuring equitable access to global markets. Supporting the development of digital platforms that connect immigrant exporters with international buyers can also streamline their entry into global trade networks and improve operational efficiencies. While these platforms are designed to address immigrant entrepreneurs' unique challenges, they can also benefit native-born entrepreneurs, suggesting potential economies of scale and scope in pooling resources to serve both groups. However, it is essential to design targeted support mechanisms that address the distinct barriers immigrant-owned firms encounter, ensuring their inclusion in the broader digital economy.

Harmonizing trade, immigration and digital policies can further amplify these efforts. A co-ordinated trade-immigration-digital (TID) policy nexus provides a holistic framework that considers the interconnectedness of these areas. Such an approach can reduce trade barriers, streamline immigration processes for entrepreneurs with digital skills and promote the adoption of digital

technologies. For instance, simplifying business visa applications for skilled entrepreneurs and integrating digital trade provisions into regional trade agreements can facilitate cross-border data flows and e-commerce while safeguarding consumer privacy and national security. Within this TID framework, the EDC's comparative advantage analysis suggests that Canada's digital trade strengths are likely enhanced when immigrant exporters' skilled human capital and foreign networks are appropriately combined with digital resources rather than relying on the latter alone.

Moreover, fostering regional collaboration and knowledge sharing is essential for maximizing the potential of immigrant-owned SMEs. APEC governments can play a pivotal role by facilitating forums and workshops to exchange best practices and success stories related to digital transformation in immigrant-owned businesses. Establishing a centralized knowledge hub with actionable insights and resources for policymakers and entrepreneurs can further build these firms' capacity to navigate the complexities of international trade and innovation.

FUTURE DIRECTIONS: RESEARCH AND POLICY AGENDAS

This study has several limitations that provide avenues for future research. One limitation is that we lacked the data required to account for the heterogeneity of immigrant firms. Future studies could explore the strategic motivations of immigrant owners when investing in digital technologies, as this can vary depending on their country of origin, cultural background and experiences. Also, the age of immigrants at the time of entry into the host country could influence their propensity to use digital resources.

While we focus on digital resources, future research could investigate the role of digital capabilities in translating these resources into better performance. Digital capabilities encompass the skills and knowledge needed to use digital technologies (e.g., Uhl and Gollenia 2016; Vuchkovski, Zalaznik, Mitreġa et al. 2023) effectively, and they can change as firms adapt to new technologies and market conditions. Further research is needed to explore how industry-specific factors may moderate or mediate the relationship between digital resources and financial performance. Industry-specific factors, such as the pace of technological change, the intensity of competition and the regulatory environment, could influence how firms leverage digital resources for international trade.

Three other areas require further empirical analyses. First, we theorized about the network scalability problem and generated findings consistent with it. However, we lacked the granular data required to validate this proposed mechanism. Thus, this presents an opportunity for researchers to build on our analysis when such data become available. Second, recall that we deliberately focused on risk-adjusted profitability as the performance outcome, given its relative significance for internally funded expansion under external financial constraints. Still, Neville, Orser and Riding et al.'s (2014) multi-measure growth analysis of Canadian immigrant SMEs remains complementary to this study. Furthermore, having established that digital resources moderate the export intensity-profitability relationship for immigrant owners, the next step is to test whether this moderation extends to growth-based scalability measures. Specifically, future research could examine whether digital resources resolve the scalability problem across growth dimensions, or whether their benefits are concentrated in the financial sustainability channel identified here. Finally, since this paper is situated in the APEC context, future research should extend these findings beyond Canada by examining comparable firm-level datasets in other APEC member economies with active immigrant entrepreneurship policies, such as Australia, New Zealand and the United States. Cross-country comparative analyses would enable more direct policy generalizations for APEC and help identify whether the trade-immigration-digital-policy nexus identified here is broadly applicable or context-specific.

CONCLUSION: UNLOCKING POTENTIAL THROUGH DIGITAL TRANSFORMATION

This study highlights how digital resources may support immigrant exporters' scalability by strengthening the financial returns to export intensity. By applying insights from digital economics, international economics and the economics of immigrant entrepreneurship, we offer a framework for understanding how digital technologies can reduce barriers to international trade and improve export performance for immigrant businesses. We document three interrelated findings: 1) immigrant-owned firms exhibit higher export intensity but lower profitability than non-immigrant peers, consistent with the network scalability problem; 2) digital resources significantly amplify the relationship between export intensity and financial returns; and 3) this amplification effect is strongest for immigrant-owned exporters, suggesting that digital resources are a particularly effective lever for closing the immigrant-non-immigrant performance gap.

These findings are grounded in Canadian data but carry suggestive implications for other APEC economies, particularly those with significant immigrant entrepreneur populations and active digitalization agendas. Future research comparing these dynamics across APEC member countries will be important for developing robust, region-wide policy frameworks. In the interim, the trade-immigration-digital-policy nexus advanced in this paper offers a useful integrative lens through which APEC policymakers can evaluate and design supportive interventions for immigrant-owned SMEs. In doing so, they can unlock their full potential to drive innovation, create jobs and contribute to the prosperity of APEC economies.



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