BUSINESS
**FINLAND**

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# EFFORTS OF FINNVERA, FINPRO, AND TEKES IN PROMOTING INTERNATIONALLY ORIENTED SMEs

IMPACT STUDY

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# TABLE OF CONTENTS

# FOREWORD

Finnish wellbeing is based on the wealth and jobs created by the success of Finnish companies on the global market. Traditionally, the Finnish big companies have succeeded in the international markets. There has been growing debate that also SMEs must be able to continuously renew and reinvent themselves and increase exports via high added-value products and services. In terms of global competitiveness, it is recommended that Finnish SMEs specialize in the newest working methods, business models and technologies, which have most value-added effects in the value chain.

Well-functioning innovation environment for SMEs help their business activities to grow by bringing radical innovations to the economy. Such development expand innovation activities to new business fields and improve international competitiveness. It has been agreed between Tekes and the Ministry of Economic Affairs and Employment (TEM) that Team Finland collaborators' achievements will be monitored through impact analyses and studies of individual target areas. A target area in this impact study was Tekes-based and called as "Innovation-led Export Growth".

In this impact study, the purpose was to produce a combined forward looking (ex ante) evaluation analysis of how Tekes, Finpro and Finnvera have reached the objectives related to global competitiveness of SMEs. The study took several perspectives on measuring international orientation of SMEs. First, there was an analysis how Team Finland in general has worked as a new networking concept, including the international benchmarking of other countries (Sweden, Denmark, Ireland and Netherlands). Then econometrical analysis measured the success of those SMEs, which were clients of Tekes, Finpro and Finnvera compared to non-treated SMEs. Finally, there was versatile case analysis from three ecosystems: Digital Health, Food and Maritime & Offshore.

This impact study was carried out by the evaluation team from Etlatieto Ltd. and 4Front Ltd. Business Finland wishes to thank the writers for their thorough and systematic approach. Business Finland expresses its gratitude to steering group and all others that have contributed to the study.

Helsinki, March 2018

Business Finland

# TIIVISTELMÄ

Keväällä 2017 *Tekes* valitsi *Etlatieto Oy*:n ja *4FRONT Oy*:n arvioimaan kolmen *Team Finland* -toimijan – Finnveran, Finpron ja Tekesin – vaikuttavuutta kansainvälisesti orientoituneiden pk-yritysten keskuudessa vuosina 2009–2017.[1] Tämä loppuraportti vastaa alkuperäisen tarjouspyynnön kysymyksiin hyödyntäen kuutta eri lähestymistapaa. Tässä tiivistelmässä esitetään hankkeen päähavainnot, johtopäätökset ja toimenpidesuositukset, joista on yhteenveto oheisessa kuviossa.

Yhteenveto arvioinnin havainnoista ja suosituksista.


## *TEAM FINLAND* -TOIMINTAA TULEE KEHITTÄÄ, EI HYLÄTÄ

Kansainvälisen arviointi- ja tutkimuskirjallisuuden perusteella havaitaan, että innovatiivisuus, kansainvälistyminen ja kasvu ovat yhteydessä toisiinsa siten, että syy-seuraussuhteet näiden välillä menevät kaikkiin suuntiin. Niinpä näiden kolmen seikan edistäminen on tehokkaimmillaan silloin, kun niitä edistäviä politiikkatoimia koordinoidaan keskitetysti. Tutkimuskirjallisuuden perusteella *Team Finland* -tyyppiset rakenteet ovatkin perusteltuja.

[1] *Team Finlandiin* kuuluu tusina eri organisaatiota, joten tämä arvio koskee siitä vain osaa. *Kansainvälisesti orientoituneella* tarkoitetaan yritystä, jolla on joko vientiä tai ulkomaista myyntiä/henkilöstöä. *Pk-yrityksellä* tarkoitetaan tässä virallisen Eurostatin/Tilastokeskuksen määritelmän mukaista pk-yritystä, kuitenkin pois lukien Suomessa 0–9 henkilöä työllistävät mikroyritykset. Näillä rajauksilla arvioinnin piirissä on siis kunkin kolmen organisaation osalta yksi yhteinen kohdejoukko mutta ei kuitenkaan kaikki asiakkaat.

Katsomme myös, että haasteistaan huolimatta *Team Finland* on edistysaskel sitä edeltävään aikaan. Koska *Team Finlandissa* on näkemyksemme mukaan kyse nimenomaan *taloudellisten* kansallisten intressien edistämisestä, kannatamme TF-vetovastuun siirtämistä työ- ja elinkeinoministeriölle. Haluamme kuitenkin korostaa, että taloudellisen intressien painottamisesta huolimatta kyse tulee olla kaikkia ministeriöitä koskevasta yhteistyöstä. Ulkoministeriön – mutta myös opetus- ja kulttuuriministeriön sekä muiden ministeriöiden – tulee jatkossakin olla *Team Finlandin* keskeisiä toimijoita. *Finpron* ja *Tekesin* fuusiona vuoden 2018 alussa käynnistynyt *Business Finland* on tervetullut askel, mutta ei yksinään ratkaise kaikkia *Team Finlandin* haasteita.

## VERTAILUMAIDEN TOIMINTA STRATEGISEMPAA JA SUORAVIIVAISEMPAA – TAVOITTEEKSI MEILLEKIN

Siinä missä Ruotsin *Team Sweden* -toiminta on hyvin samankaltainen kuin *Team Finland,* ovat Hollannin, Irlannin ja Tanskan vastaavat toiminnot Suomea strategisempia ja tiukemmin koordinoituja. Maavertailussa paljastuu myös muita eroja. *Team Finland* ei nykyisellään edistä kansainvälistymistä ”kädestä pitäen”: esimerkiksi Irlannissa tarjotaan kansainvälisten markkinoiden myyntikoulutusta ja Tanskassa on *Business Finlandin Nuoret Innovatiiviset Yritykset* -ohjelman kaltaista vientikiihdytystoimintaa. Toisinaan Team Finland -tyyppisen toiminnan takaa löytyy toimintoja, jotka Suomessa eivät ole integroidu *Team Finlandiin* – esimerkiksi Ruotsissa ulkomaisten osaajien rekrytointi on *Business Swedenin* sateenvarjon alla.

Kansainvälisessä kontekstissa *Team Finland* näyttäytyykin pikemmin kattoajatuksena ja löyhänä verkostona kuin yhtenäisenä organisaationa. Maat, joissa on selkeät keskitetysti sovitut toimintaperiaatteet ja tiukka koordinaatio *Team Finland* -tyyppisessä toiminnassa, ovat myös päässeet korkeampaan tehokkuuteen ja suurempaan vaikuttavuuteen tämän toiminnan osalta. Jatkossa myös *Team Finlandia* olisi perusteltua viedä tähän suuntaan.

## *TEAM FINLANDIN* VAIKUTUSPIIRI KASVANUT – ASIAKKUUKSIEN KOKONAISHALLINTAA ON SELKEYTETTÄVÄ

Vuonna 2009 *Finnveran, Finpron* tai *Tekesin* asiakkaina oli 29 % Suomessa toimivista kansainvälisesti orientoituneista pk-yrityksistä. Vuonna 2014 vastaava osuus oli jo 44 %. Ainakin näiden kolmen organisaation osalta *Team Finlandin* peitto on siis kasvanut nopeasti. Tilastollisen yritysanalyysin perusteella havaitsemme myös, että nämä yritykset ovat yhä todennäköisemmin samanaikaisesti useamman *Team Finland* -toimijan asiakkaita.[2] Analysoimme myös, onko näiden kolmen *Team*

[2] Joskin kaikkien kolmen yhtäaikainen asiakkuus on edelleen melko harvinaista – vuonna 2014 noin 6 % tästä kohdepopulaatiosta.

*Finland* -toimijan kesken ”syöttöliikennettä” siten, että asiakkuus niistä yhden kanssa lisäisi todennäköisyyttä päätyä kahden muun asiakkaaksi. Vaikka syöttöliikenteestä tuli viitteitä yrityshaastatteluissa, tilastollisessa mielessä emme tällaista yhteyttä havainneet.

*Team Finlandin* peiton kasvaessa ja monien samanaikaisten *Team Finland* -organisaatioasiakkuuksien yleistyessä on asiakkuuden kokonaishallinta kasvava – ja käytännössä vielä ratkaisematon – haaste. Tarkemmin sanoen *Team Finlandin* alaiset organisaatiot kyllä hallitsevat tahoillaan yritysasiakkuuksiaan mutta organisaatiorajapinnoissa tai koko *Team Finlandin* tasolla asiakkuuksien jatkuminen, siirto, koordinaatio tai yhteisvaikuttavuuden arviointi ei toimi. Mikäli *Team Finlandin* toiminnallista yhteistyötä halutaan aidosti tiivistää, tulisi tämä näkyä myös koordinoidussa asiakkuuksien hallinnoinnissa.

*Finnveran, Finpron* ja *Tekesin* vaikutus kansainvälisesti orientoituneiden pk-yritysten menestykseen eri ulottuvuuksissa. *Tummempi plussa:* tilastollisesti merkitsevä positiivinen vaikutus; *vaaleampi plussa:* tilastollisesti lähes merkitsevä positiivinen vaikutus. Tulkinta tämän raportin kuvioista 9–11, joissa tarkemmat tulokset.[3]

| | Työllisyys, *Suomi* | Työllisyys, ulkomaat | Liikevaihto, *Suomi* | Liikevaihto, ulkomaat | Tuottavuus, *Suomi* | Vienti *Suomesta* |
|---|---|---|---|---|---|---|
| ***Finnvera*** | | | + | | + | |
| ***Finpro*** | + | + | + | | | + |
| ***Tekes*** | + | | + | | | + |

## *FINNVERA, FINPRO* JA *TEKES*: MERKITTÄVIÄ POSITIIVISIA VAIKUTUKSIA TIETYISSÄ ULOTTUVUUKSISSA

Organisaatiotason vaikuttavuuden todentamiseksi rakensimme ekonometrisen mallin, jolla eristimme *Finnveran, Finpron* tai *Tekesin* intervention (tapauksesta riippuen: lainan, palvelun, takauksen ja/tai tuen) aiheuttaman ”ylimääräisen” kontribuution kohdeyrityksen menestykseen kuudessa ulottuvuudessa. Myös valikoituminen eli se, että asiakkaaksi päätyvät yritykset saattavat olla lähtökohtaisesti innovaatio- ja/tai vientiorientoituneempia, huomioitiin mallinnuksessa. Näiden 18 ekonometrisen analyysin yhteenveto näkyy oheisessa taulukossa. Tulosten mukaan jokaisella kolmesta organisaatiosta on merkittäviä positiivisia vaikutuksia useissa, joskaan ei kaikissa, ulottuvuuksissa.[4]

[3] Taulukossa on jätetty tyhjäksi ne ruudut, joissa johtopäätökseen liittyvä epävarmuus on liian suurta luotettavan päättelyn tekemiseksi. Huomaa, että tässä yhteydessä pidemmän aikavälin estimaatit perustuvat vähäisempiin havaintoihin. Siten kuvioiden 9–11 viimeinen havainto perustuu yhden vuosikerran yritysten kehitykseen, mikä kasvattaa havaintoon liittyvää epävarmuutta.

[4] Kaikkien kolmen organisaation tapauksessa politiikkainterventiot ovat sitä tyyppiä, että onnistuessaankin niiden vaikutus näkyy yrityksen menestyksessä vasta usean vuoden viiveellä – tässä yhteydessä sovelluttu melko lyhyt tarkasteluikkuna ei tee täyttä oikeutta näiden organisaatioiden vaikuttavuudelle.

Edellisen sivun taulukon tulokset ja keräämämme muu evidenssi viittaa siihen, että *Finnvera, Finpro* ja *Tekes* toteuttavat elinkeinopoliittisia missioitaan järkevällä tavalla. Myös muu analyysimme tukee näkemystä, että jokaisen kolmen organisaation operatiivinen toiminta on pääpiirteittäin kunnossa. *Team Finlandin* keskeisimmät haasteet ovatkin yksittäisiä organisaatiota ylemmällä tasolla ja tilanteissa, joissa on tarpeen liikkua *Team Finlandin* alaisten organisaatioiden välillä.

## *TEAM FINLAND* KAIPAA KIRKASTA VISIOTA, SELKEÄÄ TARJOAMAA JA YMMÄRRETTÄVÄÄ VASTUUNJAKOA

Osana arviointityötä järjestimme työpajan parille kymmenelle pitkäaikaiselle *Team Finland* -toimijalle. Työpaja vahvisti myös haastattelujen perusteella muodostunutta käsitystä siitä, että perusasioissa on vielä tehtävää. Puutteellisen jalkauttamisen ja jatkuvien muutosten seurauksena kokonaiskuva *Team Finlandista* on jäänyt epäselväksi. TF-tason asiakkuuden hallintaa ei ole voitu toteuttaa tehokkaasti, koska *Team Finland* -toimijoiden keskinäiset vastuut, tavoitteet ja palvelujen tarjoama ovat hahmottuneet heikosti.

Johtopäätöksemme on, että TF-toiminta tarvitsee työkalukseen navigaattorin. Käytännössä puhutaan kuvasta, josta ilmenee *Team Finlandin* palvelut ja prosessit, sekä niiden soveltuvuus yrityksen yleisen kehityksen ja kansainvälistymisen eri vaiheissa kohderyhmittäin.

## YRITYKSET NÄKEVÄT TEAM FINLANDIN KESKEISENÄ KANSAINVÄLISENÄ VERKOTTAJANA

Yritykset katsoivat *Team Finlandin* ohjelmatoiminnan edistäneen verkostoitumista. *Team Finlandin* katsottiin nopeuttaneen kansainvälisen liiketoiminnan laajentumista ja kasvattaneen kansainvälisen liiketoiminnan lopulta saavutettua laajuutta. *Team Finlandin* toiminnan kautta opittiin uusia asioita mutta oppien sisällöt vaihtelivat yrityksen tyypin ja kehitysvaiheen mukaan. Kiitosta saivat erityisesti kasvuohjelmat: niiden katsottiin sekä tasaistaneen että parantaneen palveluiden laatua.[5]

Sekä yrityshaastatteluissa että *Team Finland* -toimijoiden työpajassa keskusteltiin ”yhden luukun” periaatteen tavoittelusta. Vaikka ”yksi luukku” tulisi toki olla suunnittelun lähtökohtana, sitä ei pidetty täysin realistisena tavoitteena. Päävaihtoehdoksi nähtiin ”ei väärää ovea” periaate, jossa ensi- tai pääkontakti *Team Finlandissa* ottaisi vastuun asiakkaan ohjaamisesta eteenpäin ”kädestä pitäen” – siis asiakkuus siirtäen pikemminkin

[5] Yritysten mukaan ennen kasvuohjelma-aikaa saadun avun laatu oli henkilöriippuvaista ja liittyi yksittäisen konsultin osaamiseen.

kuin vain eteenpäin osoittaen. Alkuvuosina yritykset havaitsivat, että *Team Finlandin* toimijoiden kesken oli päällekkäisyyksiä ja jopa keskinäistä kilpailua. Kansallisella tasolla nämä ovat sittemmin lieventyneet tai hävinneet. Toisinaan nousee kuitenkin esiin puutteellinen koordinaatio alueellisen tason – toistaiseksi käytännössä isompien kaupunkien – kanssa silloin, kun alueelliset toimijat ovat aktiivisia joko ulkomaisen liiketoiminnan houkuttelussa tai alueensa kansainvälistymisen edistämisessä. Näkemyksemme mukaan olisi tehokkainta, että *Team Finland* koordinoisi kansainvälistymistoimia; työpajassa hahmottelimme puumallia, jossa alueelliset toimijat ovat puun juuret tukemalla yritysten toimintaedellytyksiä ja *Team Finlandin* kansalliset ydintoimijat koordinoivat ja kokoavat kansainvälistymisen ponnistelut.

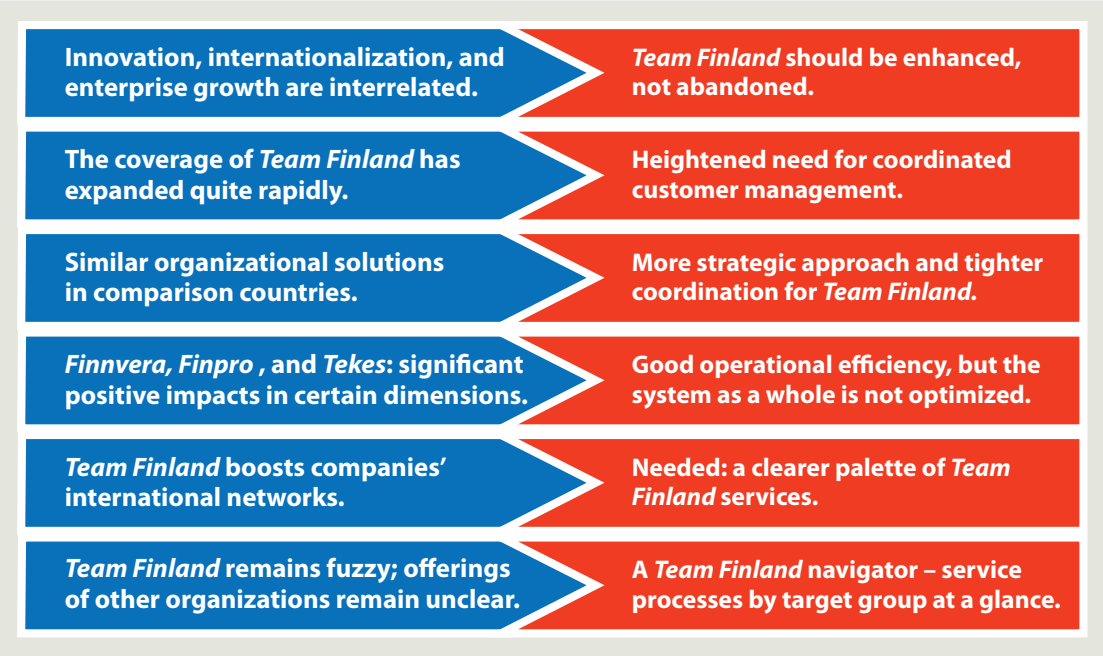
## YHTEENVETONA: *TEAM FINLANDIN* TOIMINTA ON PERUSTELTUA, TEKEMISESSÄ TEHOSTETTAVAA

Arvioituamme *Team Finlandin* ja kolmen sen alaisen organisaation toimintaa edellä läpikäydyistä näkökulmista toteamme, että sinänsä toiminnan perusajatus on järkevä ja kannatettava. *Finnvera*, *Finpro* ja *Tekes* – vuoden 2018 alusta kaksi jälkimmäistä *Business Finlandina* – toteuttavat elinkeinopoliittisia missioitaan operatiivisesti hyvin. Haasteet ilmenevät yksittäisiä organisaatiota ylemmällä *Team Finland* -tasolla – nykyisen *Team Finlandin* hahmottumaton strategia, epäselvät tehtävänjaot ja puutteellinen koordinaatio johtavat tehottomuuteen, vaikka ”koneiston” yksittäiset osat olisivatkin tehokkaita. TF-koordinaation näkökulmasta *Business Finland* on edistysaskel, joka poistaa yhden kokonaisuuden kannalta keskeisen organisaatiorajapinnan, mutta muilta osin se ei *Team Finlandin* haasteita ratkaise.

# EXECUTIVE SUMMARY

In spring 2017, *Tekes* commissioned *Etlatieto Oy* and *4FRONT Oy* to conduct an impact study of three *Team Finland* actors: *Finnvera, Finpro,* and *Tekes*. As requested in the original call for proposals, the study concentrates on the three organizations' interaction with internationally orientated small and medium-sized enterprises (SMEs), core target groups for all the three organizations, in 2009–2017.[6] This impact study provides answers to the set of questions posed in the original call for proposals by employing a mix of qualitative and quantitative approaches. This summary presents our core findings and recommendations, which are briefly captured in the attached figure.

Synopsis of the core observations and recommendations.




## TEAM FINLAND SHOULD BE ENHANCED, NOT ABANDONED

In reviewing the scholarly literature, we find that innovation, internationalization, and enterprise growth are intimately related. Thus, advancing any one of these factors independently might be inefficient and calls for the coordination of related policies. Although there are only few relevant studies, earlier work lends support for organizations such as Team Finland.

Compared to the time before its existence, *Team Finland* represents an improvement in the coordination of public activities supporting enterprise internationaliza-

[6] With this focus, the study excludes domestically oriented and both micro (0–9 employees) and large (250+ employees) enterprises. Therefore, the study does not consider the three organizations' operations at large. *Team Finland* consists of dozens of organizations. Thus, this impact study does not concern *Team Finland* at large.

tion. Because, at its essence, this activity is an inter-ministerial effort to promote Finnish **economic** interest, we endorse the transfer of *Team Finland* coordination to *The Ministry of Economic Affairs and Employment*. Nevertheless, we wish to emphasize that other ministries – particularly *The Ministry for Foreign Affairs* but also, e.g., *The Ministry of Education and Culture* – should remain fully engaged. The merger of *Finpro* and *Tekes* as well as the formation of *Business Finland* removes one organizational boundary under *Team Finland* but does not solve its other challenges.

## COMPARISON COUNTRIES: MORE STRATEGIC APPROACH, LESS ORGANIZATIONAL CACOPHONY

*Team Sweden* appears quite similar to *Team Finland,* but in all other comparison countries – Denmark, Ireland, and the Netherlands – the public activities for promoting innovation-led export growth are both more strategic in focus and more organizationally tight-knit. There are also other differences. At times, other countries are more hands on; i.e., Ireland offers training of international sales personnel, and Denmark has an internationalization accelerator program that shares features with the Young Innovative Companies program of *Business Finland*. On occasion, activities in other countries include domains that do not fall under *Team Finland*. For example, luring international experts into the country falls under the umbrella of *Team Sweden*.

In international comparison, *Team Finland* presents itself as a loose guiding concept and a form of soft coordination. Countries that employ central leadership and tight coordination in similar activities have achieved greater efficiency and higher impact. In our view, Finland should also consider a more tightly knit collaboration and a more strategic approach.

## THE EXPANSION OF *TEAM FINLAND* CALLS FOR AN OVERARCHING CUSTOMER MANAGEMENT

The coverage of *Team Finland* has expanded quite rapidly. In 2009, 29% of the internationally oriented SMEs in Finland were customers of *Finnvera, Finpro,* or *Tekes*. By 2014, the corresponding share had grown to 44%. Over time, it has also become more likely that a company is a customer of more than one of the three organizations.[7] We also studied "feeding", i.e., whether becoming a customer of one organization increases the likelihood of engaging with the other two. Although some of our company interviews suggest otherwise, we do not observe such feeding in the statistical sense.

The expanding coverage of *Team Finland* and the higher likelihood of simultaneously being a customer of multiple *Team Finland* organizations necessitate customer relationship management across the separate organizations under the *Team Finland* umbrella. However, this does not currently occur in a well-coordinated manner, even though each individual organization is quite capable of handling its own customers.

[7] However, being a customer of all three organizations simultaneously (±1 year) is still quite rare; this is the case for some 6% of the target population.

## *FINNVERA, FINPRO,* AND *TEKES* HAVE SIGNIFICANT POSITIVE IMPACTS IN CERTAIN DIMENSIONS

We devise an econometric setup to isolate the additional causal impact of *Finnvera, Finpro,* or *Tekes* support (depending on the case: a guarantee, a loan, a service, and/or a subsidy) on six enterprise performance measures. Our setup also controls for selection. The idea is to compare the differences in development over time between treated (or supported) and non-treated companies (not supported but otherwise similar in observable dimensions). The 18 separate econometric analyses are summarized in the attached table. For all three organizations, we find evidence of positive and statistically significant impacts on some but not all of the considered dimensions.

Our econometric results and other collected evidence suggest that *Finnvera, Finpro,* and *Tekes* serve a purpose in Finnish society and fulfill their policy missions sensibly. We cannot directly observe how well these organizations address market failures or promote country-level systemic developments, but our qualitative evidence suggests that these effects are nevertheless present to a reasonable extent.

The impacts of *Finnvera, Finpro,* and *Tekes* among internationally oriented SMEs in six enterprise performance measures. *A dark-colored plus sign* (+) indicates a positive and statistically significant impact; *a light-colored plus sign* (+) indicates a finding that is almost statistically significant. Please find more detailed results in Figures 9–11 in the main text.[8]

| | Employment, *Finland* | Employment, abroad | Sales, *Finland* | Sales, abroad | Labor productivity, *Finland* | Export from *Finland* |
|---|---|---|---|---|---|---|
| ***Finnvera*** | | | + | | + | |
| ***Finpro*** | + | + | + | | | + |
| ***Tekes*** | + | | + | | | + |

## NEEDED: A CLEAR VISION, AN UNDERSTANDABLE DIVISION OF LABOR, AND A LUCID SERVICE OFFERING

Some twenty long-standing *Team Finland* actors participated in our forward-looking workshop. Although the participants have been part of *Team Finland* for several years, they still found the concept to be fuzzy and unclear. Customer relationship management was considered inefficient because the division of labor among the *Team Finland* organizations was unclear and the overall smorgasbord of *Team Finland* service offerings was difficult to conceive.

A stout consensus confirmed that *Team Finland* needs a **Navigator**, which provides an overview of the available services and helps to see the mix of services *Team Fin-*

[8] An empty cell in the table indicates that the statistical significance of a result is too low to draw reliable conclusions on the direction of the impact. Please note that the longer-run estimates in Figures 9–11 are based on fewer observations, which increases the uncertainty of statistical inference.

*land* offers to various company archetypes. The proposed Navigator would map a process for enterprise internationalization and the various *Team Finland* services for each stage. It would establish an overview of the *Team Finland* service portfolio and provide a common language for the providers and users of *Team Finland* services.

## *TEAM FINLAND* BOOSTS COMPANIES' INTERNATIONAL NETWORKS

From the enterprise perspective, the affordances of *Team Finland* programs are generally such that they enable building new skills and competence and solving technological and business problems faster or in a larger scale than would otherwise be possible. Additionally, newer entrants view participation in the programs as an opportunity to learn the industry structures, obtain relevant information about the market and potential customers, and enter industry networks. The latter is also mirrored by more established enterprises, which report that one of the benefits is meeting new potential partners. At the program level, it is clearer for the stakeholders that participation in *Team Finland* programs contributes to building new collaboration by bringing together different types of actors and new combinations. Across the stakeholder groups, the common opinion is that successful program implementation hinges on an in-depth understanding of a particular industry, its markets, customers, value chains, and networks. In particular, *Growth Programs* received high remarks; they have improved both the quality and consistency of export promotion.[9]

Both the providers and users voted for a one-stop shop of *Team Finland* services but simultaneously acknowledged that it is currently far from reality and that the compelling idea of the one-stop-shop may not be entirely realistic. Instead, in our workshop, the discussion moved to promoting a "no wrong door" approach, in which the first point of contact in *Team Finland* would assume responsibility to learn the customer's needs and identify a suitable mix of services in the overall *Team Finland* palette. Additionally, when customers move from one *Team Finland* organization or actor to another, they would not simply be pointed forward but would be personally introduced to the new *Team Finland* contact.

## SYNOPSIS: *TEAM FINLAND* IS USEFUL, BUT IT NEEDS GAINS IN EFFICIENCY

After studying *Team Finland* and its three organizations, we conclude that the rationale behind *Team Finland* is solid and serves a purpose. *Finnvera, Finpro,* and *Tekes* fulfill their policy missions with good operational efficiency. The main challenges are found in *Team Finland* itself rather than in the organizations under it. The strategy of *Team Finland* is not well articulated, its division of labor is unclear, and it lacks explicit coordination. These issues make *Team Finland* inefficient as a whole, even if the organizations under it are quite efficient. The establishment of *Business Finland* improves organizational efficiency but does not solve the remaining issues in *Team Finland*.

[9] Before the *Growth Programs,* the quality of the services was more tied to the competences and personality of the consultant in question.

# INTRODUCTION

Innovativeness is the cornerstone of Finland's survival strategy in the global economy. Correspondingly, Finland has traditionally invested heavily on R&D and is still one of the most innovation intensive countries in the world. However, since the economic crisis that started in 2009, the economy has struggled to grow. While R&D inputs have remained at a high level, the driving force of the Finnish economy, exports, has not been able to fuel the growth of the economy. In fact, in 2016 the export volume of goods was at the 2005 level. In this situation, it is important to focus on the new roles of Team Finland in supporting internationalization and innovation-led export growth. This study addresses the existing best practices and proposes new solutions for ever more international and networked innovation.

The two target areas of the Team Finland collaborators (Tekes, Finpro, and Finnvera), outlined by Tekes and The Ministry of Economic Affairs and Employment (MEAE) are: 1) Globally competitive business and industry, and 2) Top-level innovation environment.

The impact study is built around three main themes. 1) The economic performance of Team Finland -funded internationally oriented SMEs, 2) Team Finland, innovation-led export growth and ecosystems, 3) Future Suggestions and Recommendations.

This study takes a closer look at the success of Team Finland collaborators up until today using a mix of quantitative and qualitative methods, including econometric analysis, international benchmarking, interviews, and interactive workshops. The evaluation methods are described in more detail below.

**The econometric analysis** exploits a matching method (Coarsened exact matching, CEM). Matching is used to form a control group that – except for receiving Tekes funding, Finnvera funding or Finpro promotion – is otherwise as similar as possible as the customers of Team Finland actors (treatment group). In this analysis, the matching is based on employment, company age, industry, innovativeness, and other relevant characteristics of the company. After matching, the constructed data is analyzed using difference-in-differences (diff-in-diff) method that enables us to infer causality rather than just correlations.

**The ecosystem analysis** is built using impact cases. The ecosystems approach uncovers the actors and their relationships to provide the lessons about the drivers for development and system failures, e.g. absence of institutions, lack of capabilities or interactions. The purpose is to understand the dynamics of the ecosystem and highlight the potential future roles for Team Finland

in strengthening collaboration in international value chains to create innovation and exports.

**The international benchmarking** maps actors and interventions for innovation led export growth in Sweden, Denmark, The Netherlands, and Ireland. The focus is on promoting global value networks and cooperation between incumbent firms and new business models.

In a **workshop** Team Finland representatives and key stakeholders worked on a roadmap for the future. The workshop builds on the summative parts of the impact assessment and ecosystem analyses. The workshop uses the tried GRIP method that has been used in complex multi-stakeholder situations for road-mapping similar strategic steps.

**A systematic literature review** provides a basis for the impact study. The analysis covers recent and relevant research articles and surveys, as well as discussion papers and other articles relevant to the topic, such as previous evaluation reports of the three key organizations and Team Finland.

# STUDY FOCUS – TEAM FINLAND ACTORS FINNVERA, FINPRO, AND TEKES IN A NUTSHELL

As outlined by the original commission, this study concentrates on three Team Finland actors—Finnvera, Finpro, and Tekes—that all provide publicly funded services to support the internationalization of Finland-based companies. Respectively, the study focuses mostly on the three individual Team Finland actors, rather than the networks, operating models or coordination of Team Finland itself.

**Finnvera** is a specialized financing company owned by the State of Finland and is the official Export Credit Agency (ECA) of Finland. Finnvera provides financing for the start, growth and internationalization of enterprises and guarantees against risks arising from exports. Finnvera offers loans, domestic guarantees, venture capital investments, export credit guarantees, and other services associated with financing of exports.

Finnvera has undergone some changes in its focus and operations during the past years. In 2012, the focus of operations was shifted more to speeding up the growth and internationalization of companies and to improving the financing options available for start-up enterprises. In addition, Finnvera's direct venture capital investments conducted by Seed Fund Vera were terminated in 2016.

Finnvera's possibilities to fund and guarantee have been strengthened by the government in the past years. Between the years 2008 and 2017, Finnvera's credit loss compensation from the state has risen from €12.5 to €64.6 million. Also Finnvera's authorization to grant export credit guarantees has risen significantly within the past 10 years from 7.9 billion (2007) to 27 billion (2017). However, it must be noted that export credit guarantees are not within the scope of this study.

**Finpro** helps Finnish SMEs go international, encourages foreign direct investment in Finland and promotes travel to Finland. Finpro is a public organization consisting of Export Finland, Visit Finland and Invest in Finland. Finpro operates in 37 Trade Centers in 31 countries and has 6 offices in Finland. The Association Finpro ry and the Finnish Tourist board were merged into a Finpro Oy in the beginning of 2016. Simultaneously, Finpro's allowances in the state budget were cut back below

the 2008 level to €33.6 million. In 2015, the respective allowances were around €46 m, including both general allowances and a one-time allowance for the growth programs.

Export Finland, the arm of Finpro that focuses on the promotion of export of Finnish companies, accounts for the major part of the Finpro operations: of Finpro's 251 employees, 175 persons work for Export Finland, either in Finland or abroad.

**Tekes** is a publicly funded expert organization for financing research, development and innovation in Finland. In addition to funding technological R&D, Tekes finances service-related, design, business, and social innovations. The main focus is on growth companies that are seeking growth in global markets. In 2017, the central government budget appropriations for R&D funding for Tekes was €322.2. [10]

Tekes funding is mainly organized around programs. In the Team Finland network, Tekes offers innovation funding and services for internationalizing companies, promotes the internationalization of companies and supports efforts to attract foreign investment in Finland.

Tekes has undergone major changes during the past years. Its funding has been cut significantly since 2016 (-€130 m), and it has shifted its focus to young (<5 yrs) companies; the SHOKs were established in 2008, and their public funding was shut down from 2017 onward. In 2014, Tekes Venture Capital Ltd. was established. These changes have been accompanied with continuous structural re-organization within Tekes.

[10] Government R&D funding in the state budget 2017, Statistics Finland. (https://www.stat.fi/til/tkker/2017/tkker_2017_2017-02-23_en.pdf)

# EARLIER IMPACT STUDIES

This section provides an overview of the previous evaluations of Team Finland and its individual members—Tekes, Finpro, and Finnvera—focusing on the aspects related to internationalization. The chapter also provides an overview of the academic literature related to export promotion and government intervention that aims to overcome presumed market failures in the financing of innovation and internationalization.

The previous Team Finland evaluation (Salminen *et al.*, 2016) suggests that growth programs are a welcome policy tool even though longer-term conclusions could not be drawn at that time. The previous individual reviews of the network members indicate that each of the institutions have their role in the promotion of the internationalization of firms. However, the individual reviews also suggest that there was room left for improvement in the areas such as strategic focus, resource utilization, synergy effects, and impact analysis.

The academic literature indicates that internationalization is driven by innovation, recommending the coordination of innovation and internationalization policies under the same roof (Altomonte, Aquilante, Békés, & Ottaviano, 2013). Second, the interpretation of export-led growth literature requires caution due to selection problems. Third, the theoretical case for export promotion relies on asymmetric information and externalities. Whether such policies indeed work through the extensive margin (i.e., entry into export markets) (Lederman, Olarreaga, & Zavala, 2016) or through the intensive margin (i.e., the exporting volume of a company) (Görg, Henry, & Strobl, 2008) calls for further analyses. Finally, empirical evidence suggests that exports are more sensitive to financial shocks than are domestic sales (Amiti & Weinstein, 2011).

## TEAM FINLAND

### ROLE

Team Finland is a network of public agents that provides internationalization services for firms. Team Finland promotes the external relations and country brand of Finland, the internationalization of Finnish firms and foreign investments directed at Finland. The network aims to promote the co-operation between different institutions in the sector. The operations of the network are steered by the government. The services provided by the network members vary from consultation to finance. Team Finland members provide different kinds

of instruments for their client firms to support their internationalization: Tekes provides subsidies and loans, Finnvera provides loans, guarantees and export credit guarantees, and Finpro provides subsidized services. The services provided by the network members are custom-made for the client firms based on the client's needs regarding internationalization.

The idea of the Team Finland network first emerged in the early 2000s, and the first steps toward its creation were taken in the early 2010s; the first practical activities occurred in 2012. In 2016, the development and reform of the activities were placed on the agenda. Based on the development proposals, the coordination of Team Finland activities was transferred from the Prime Minister's Office to the Ministry of Economic Affairs and Employment. Furthermore, Tekes and Finpro were merged together under the name Business Finland at the beginning of 2018. The reform also encompasses other changes that aim to smoothen and harmonize the services, remove overlapping activities and enhance the activities of the international network.

## PREVIOUS EVALUATIONS

While the previous evaluations do not address the whole Team Finland network, the constituent parts of Finpro, and specifically the Team Finland growth programs (Salminen *et al.,* 2016), and Tekes (Reid *et al.* 2016) have been evaluated before. The evaluation of Team Finland growth programs from 2016 (Salminen *et al.,* 2016) analyzed Export Finland growth programs based on a firm survey and on the interviews of people from ministries, agencies and other interest groups. The evaluation focused on the relevance of the operations model and the quality of implementation. The evaluation studied the growth programs as a whole rather than focusing on single programs.

The findings of the evaluation suggest that the growth programs are a functional and welcome tool for improving the internationalization of SMEs. At the same time, the evaluation noted that it is too early to draw conclusions about the long-term effects of the programs. However, the findings obtained so far suggested that some of the results are promising and the short-term effects of the programs are mostly positive. The evaluation notes that the programs at best provide wider visibility, information about the target market needs, access to the "right tables", and improved information exchange. However, the evaluation also indicates that there are large program-specific differences, and there remains a lot of variation in the feedback obtained from the firms.

The evaluation of the growth programs provides the following implications. The evaluation suggests that the financing and governing model should be revised so that it suits financing larger, more flexible, and more experimental programs. The report also suggests that the resource utilization could be more efficient. The cooperation and the joint resource utilization between service providers should be developed, and the focus of the operations should be improved. Furthermore, the availability of the best possible expertise should be ensured.

## EXPORT PROMOTION – FINDINGS FROM THE ACADEMIC LITERATURE

In this section, we provide an overview of the related academic literature on export promotion and on the role of government in the financing of innovation and internationalization. Additional literature references are discussed later in the chapter in relation to the overview of the individual Team Finland network members.

The relationship between exports and economic growth is a tricky issue to evaluate in a sound manner. Does export activity lead to economic growth or is it rather a by-product of growth? Alternatively, are both the exports and economic growth driven by some third, common factor that is unobservable to the researcher? The analysis of these issues remains challenging and unlikely satisfactorily addressed at the aggregate-level using macro datasets. However, the analysis of the effects of export promotion activities remains a challenging task also at the micro level. Do export promotion activities improve firm performance? The analysis of such treatment effects is complicated by the selection problems: First, there is existing evidence in the literature that more efficient firms become exporters (Clerides, Lach, & Tybout, 1998). Second, there is a common view that firms self-select into export promotion services; the decision to utilize such services is likely correlated with the unobserved ability to export (Munch & Schaur, 2018). Therefore, finding a correlation between export promotion and performance might merely imply such selection. In the evaluation of treatment effects, the golden standard would be randomized experiments familiar from the laboratory studies of medical sciences. However, they are rarely used in economics, even though individual applications do also exist in the context of export promotion literature (Atkin, Khandelwal, & Osman, 2017).

There is extensive literature debating whether countries should promote the export sector to generate economic growth. Giles and Williams (2000) survey the early evidence of export-led growth, covering both cross-sectional and time-series studies. Analyzing the literature, they suggest that one needs to be very careful in the interpretation of much of the empirical research on export-led growth because the methods do not appear robust nor allow causal interpretation. In recent literature, Atkin *et al.* (2017) study a randomized experiment of an access to the foreign market—analyzing rug producers in Egypt. They find evidence that exporting firms show higher profits, quality improvements and reductions in the output per hour compared to control firms. They also find that exporting improves the technical efficiency of firms. First, the treatment firms have a higher productivity and quality. Second, treatment firms produce higher quality products within the same time interval. Third, the treatment firms show learning curves over time. Fourth, there is evidence of knowledge transfers. Olarreaga *et al.* (2016) utilize a panel of developing and developed countries, and their findings suggest that export promotion increases exports and ultimately increases GDP per capita. They, however, note that their estimates of export increases do not *per se* measure social welfare returns because an increase in exports is as-

sociated with the cost needed to produce those exports and because exports may have positive or negative externalities on non-exporting firms. However, the positive GDP per capita effects suggest that export promotion generates positive externalities that affect a wider range of firms than exporters.

Either way, governments appear to believe that it is socially desirable to subsidize exports and thereby decrease the cost of exporting for both the potential and current exporters. Bernard and Jensen (2004) find that state export promotion of U.S. firms does not have a significant effect on the probability of exporting. At the same time, they note that their results may be affected by the fact that their sample selection criteria limit the analysis only to large plants. Görg *et al.* (2008) study whether government grants increase exporting activity of Irish manufacturing firms. They find that sufficiently large grants encourage already exporting firms to export more. However, they do not find evidence that grants would encourage non-exporting firms to begin exporting. On the other hand, it is worth noting that their study analyzes grants of all types—those related to investment in technology, training, or physical capital—that are not specifically designed for promoting exporting.

Van Biesebroeck, Yu, and Chen (2015) find that Canadian export promotion services had a positive effect on exports. The findings suggest that the intensive-margin effect dominated; the trade promotion services boosted the exports to existing product-destination markets. The findings indicate that the extensive-margin effects—i.e., exports to new markets—were smaller and less robust to changes in the assumptions of the empirical models. The findings also indicate that the effect at the intensive margin required continued support, suggesting that the program did not have its effect through lowering the fixed costs of entering new markets. Furthermore, the effects appeared to be larger for older and more experienced firms.

The economic justification for export promotion relies on the argument of market failures arising from asymmetric information and from externalities related to the information collection on market conditions and business opportunities in international markets (Hausmann & Rodrik, 2003; Lederman *et al.*, 2016); private firms lack the incentives to share their information with their competitors on how to export profitably, after they have incurred the costs of the discovery—the firm (or entrepreneur) captures only a small amount of the social value generated by the creation of this knowledge. This market failure provides a rationale for government intervention. However, the nature of the market failure suggests that the intervention helps the firms at the extensive rather than at the intensive margin; obtaining information on market conditions does not depend on the quantities exported. Lederman *et al.* (2016) suggest that the earlier findings indicating that export promotion encourages exports through the intensive margin raise questions about the desirability of such programs.

In their analysis, Lederman *et al.* (2016) focus on the role of export promotion agencies in helping Latin American firms' enter into exporting. They suggest that export promotion encourages exports by helping the en-

try and survival of firms in the markets. There does not appear to be a robust impact on the intensive margin of exporting firms. These results appear to be consistent with the idea that export promotion helps to reduce the fixed costs rather than the variable costs of exporting. This conclusion would indeed be consistent with the idea that export promotion agencies remedy market failures related to informational externalities. However, there remains a question regarding what degree the results depend on the type of countries analyzed and regarding the role of the different methodologies utilized, especially given the difficulties in controlling for the differences among firms. There are also differences in the services provided by the export promotion agencies. Martincus and Carballo (2010) study Colombian exporters and find that export promotion programs that combine bundled services—ranging from counseling to trade mission and fair participation—are associated with better export performance compared to the individual services. Their findings also suggest that the effect is largest when the information asymmetry is more severe.

In a recent study, Munch and Schaur (2018) find that export promotion has a positive effect on the sales, value added, employment, and labor productivity of small Danish firms. Their findings also indicate that the gains from export promotion outweigh the costs; for small firms, the increase in value added is about three times higher than the direct costs of the export promotion program. The study also finds that the export promotion activities help firms across the whole size distribution to enter the export markets. However, positive employment, value added, and labor productivity effects are only observed among the smallest firms. Therefore, the authors suggest that the export promotion programs should target small firms if the goal of the programs is to promote increases in value added and employment.

During financial crises, exports tend to collapse relative to output. Does the deterioration in bank health explain such drops of exports relative to output? Amiti and Weinstein (2011) attempt to address the causal link between the health of banks providing trade finance and the growth of firm exports relative to their domestic sales. They find—using Japanese firms—that the health of financial institutions is an important factor affecting firm-level exports during financial crises. They also observe that the health of banks has a much larger effect on exports than on domestic sales, suggesting that financial shocks affect exports and domestic sales in a different way. Ahn, Amiti, and Weinstein (2011) review the evidence that financial factors resulted in a greater decline in exports during the financial crisis than predicted by models without financial frictions. They find evidence in support of a trade finance channel. First, they find evidence that export prices rose relative to domestic manufacturing prices. Second, the import and export prices of goods shipped by sea—sensitive to trade finance contractions—rose disproportionately more compared to those shipped by air or land. Feenstra, Zhiyuan, and Miaojie (2014) find evidence from China that credit constraints are more binding for firms when their export share grows, as the time to ship lengthens, and there is a larger dispersion of productivity—reflecting incomplete information.

Studies have also attempted to evaluate the effects of government support during the financial crisis on the performance of exporting firms. Van Biesebroeck, Konings, and Martincus (2016) study whether export promotion—information brokering and facilitation rather than direct subsidies—helped firms from Belgium and Peru to weather the financial crisis of 2009. They find that the export decline was sudden and due to lower export sales by existing exporters. They show that firms that took advantage of export support during the crisis performed better, controlling the differences among firms. They also identify the mechanism behind the observation: the supported firms were more likely to survive on the export markets and continued to export to crisis-hit countries. On the other hand, it remains difficult to draw the final conclusions from this (limited) literature because of the challenge of controlling for potentially unobserved firm-specific factors that might be behind the superior performance and survival of firms.

Finally, there remains a fundamental question of what is the ultimate factor driving the internationalization. Altomonte *et al.* (2013) study the interaction of firm-level internationalization, innovation and productivity using a sample of European countries—Austria, France, Germany, Hungary, Italy, Spain, and the United Kingdom. They document a positive relation between these firm characteristics across countries and sectors. They also find a positive correlation between internationalization and innovation, even after controlling for productivity. There is also some evidence that innovation affects internationalization. The authors suggest that it is unlikely that export promotion would lead to sustainable internationalization; internationalization goes beyond export, and internationalization over the longer term is likely to be driven by innovation. They recommend that the coordination and integration of internationalization and innovation polices are provided under the same roof, both at the national and EU level, and they propose better coordination.

## TEKES – THE FINNISH FUNDING AGENCY FOR INNOVATION

### ROLE

Tekes is a publicly funded expert organization for financing research, development and innovation in Finland. Tekes promotes innovation activities in research communities, industry and service sectors. In its activities, Tekes promotes a broad-based view on innovation; in addition to funding technological R&D, Tekes finances service-related, design, business, and social innovations. The funding provided by Tekes is targeted to projects that create the largest benefits for the economy and society in the long term. Tekes does not derive any financial profits from its activities, and it does not claim any intellectual proprietary rights. In the Team Finland network, Tekes provides innovation funding and services to internationalizing companies, promotes their internationalization and supports the efforts of attracting

foreign investment in Finland. Tekes collaborates with the other members of Team Finland and establishes networks both domestically and internationally for Finnish companies and research organizations. Since 2018, Tekes and Finpro have been merged together and operate under the name Business Finland. The aim of Business Finland is to develop an attractive and competitive innovation environment for companies to grow, change and succeed. The strategy of Business Finland is to enable companies to grow internationally and to create both a world-class business ecosystem and a competitive business environment for Finland.

## PREVIOUS EVALUATIONS

According to the evaluation from 2012 (van der Veen *et al.*, 2012), the key task of Tekes in its international role comprises helping firms to enter and expand in international markets. This objective relates to a segmentation of companies and focuses on growth companies having a capability to export. As a consequence, the cross-border R&D collaboration has a lower visibility and is considered more as an indirect means to the key objectives. The evaluation report noted that there is a limited strategic approach regarding which domains and geographical areas to focus the international science and technology collaboration efforts. The evaluation report also notes that the dedicated advice on international science and technology collaboration is too thinly distributed in the organization, and expertise on EU-R&D matters is not reaching the companies. Finally, the evaluation suggests that the active matchmaking function of Tekes representatives abroad is beyond the scope of the company.

Reid *et al.* (2016) evaluate the role of Tekes activities in improving the global competitiveness of the Finnish economy. The findings of the evaluation indicate that Tekes has a distinct role in fostering new business ecosystems. However, the longer-term effects require better synergies between the members of Team Finland. The findings of the report also indicate that the business ecosystems need tailored and diverse support beyond the activities provided by Tekes alone.

## RELATED LITERATURE

Economic theory suggests that innovation activity is prone to market failures. There are two key arguments justifying the government invention to overcome such market failures (Hall & Lerner, 2010). The first rationale is based on the 'public good' nature of innovations; the social returns exceed the private returns. Without public intervention, the positive externalities of innovations might not be realized. The second argument is based on financial market imperfections; due to asymmetric information, financial constraints may impede innovation activity. Despite the strong theoretical case for subsidizing innovation activity, the empirical evidence on the effects of R&D subsidies is far from clear-cut, reflecting the challenges in the measurement of such concepts. Indeed, while there is extensive literature on the effects of R&D subsidies, focusing particularly on the various measures of additionality, surprisingly little is known

about the actual effects of such policies. Here, we review key findings from the recent surveys that focus on the microeconometric studies analyzing the effects of R&D subsidies and briefly dip into selected individual findings on the international aspects of subsidizing R&D.

Ylhäinen, Rouvinen, and Kuusi (2016) review the microeconometric literature on the impact of R&D subsidies, covering both the international and Finnish studies. Their analysis suggests that on average the view of the previous literature is positive, albeit somewhat inconsistent, and often in the undetermined territory of being statistically insignificant. Moreover, besides very few exceptions, the previous studies neither take a stance on the overall success of innovation policy nor address the issues on the policymakers' agendas, such as the optimal level of R&D support. Zuniga-Vicente *et al.* (2014) examine the empirical literature on the effects of public subsidies on private R&D investment. Their findings indicate that there is considerable heterogeneity in the results of previous studies that cannot be explained by methodological issues alone. Becker (2015) provides a review of studies analyzing the effectiveness of various public R&D policies. The review indicates that the recent literature finds that public subsidies typically stimulate private R&D investments, in contrast to the earlier literature that often found that public subsidies crowd out private R&D investments. Dimos and Pugh (2016) provide a meta-analysis of the studies analyzing the effectiveness of public R&D subsidies. They reject the hypothesis that public R&D subsidies crowd out private investments but do not find substantial evidence of additionality.

While the above literature surveys are general in nature, there are individual studies focusing specifically on the aspects of internationalization and R&D subsidies. Hottenrott and Lopes-Bento (2014) study the effectiveness of targeted public support for R&D investment aiming to incentivize international R&D collaboration. The findings indicate that the targeted R&D subsidies increase private R&D spending – particularly among internationally collaborating SMEs. The results also indicate that publicly induced R&D investments translate into marketable product innovations. Both the publicly induced and privately financed R&D have significant output effects in terms of innovation. However, the public co-financing of projects appears to have stimulated R&D that is more fundamental in its nature, resulting in higher sales from market novelties. The policy-induced R&D on sales from market novelties appears to be highest for firms that are collaborating internationally and for SMEs.

## FINPRO

### ROLE

Finpro is a publicly owned organization that promotes the internationalization of Finnish SMEs, encourages foreign investments in Finland and promotes travel to Finland. Finpro operates Team Finland Growth Programs that promote the international business operations of Finnish companies. Finpro consists of Export Finland, Visit Finland and Invest in Finland. Their objectives are

outlined as follows. Export Finland aims to help firms find and recognize business opportunities and transform them into profitable business. It provides advisory services, contacts and networking possibilities for the client firms. Invest Finland is a central part of Finpro that focuses on attracting foreign companies to Finland. Its goal is to strengthen the knowledge clusters, increase employment and promote the internationalization of firms. It provides information about Finland and develops and coordinates national foreign investments by networking with both domestic and foreign agents. It collects and maintains information about foreign companies in Finland. Finpro's global network is an important part of the operations of Invest Finland abroad. Visit Finland promotes tourism in Finland. It collaborates with ministries, travel businesses, transport companies, and regions in terms of research, product development and marketing. Since 2018, Finpro has been operating under the name Business Finland following its merger with Tekes.

## PREVIOUS EVALUATIONS

Etla conducted a microeconometric impact study of Finpro in 2011. In that study report, Hyytinen, Pajarinen, and Ylä-Anttila (2011) study whether Finpro customership is related to internationalization and to the performance of client firms. According to the findings in the report, Finpro customership is positively associated with internationalization, measured in terms of new subsidiaries abroad or geographical expansion of foreign operations. The findings indicate that Finpro customership is positively associated with an exports indicator, even though the results vary between methods. In general, there is no statistically significant relationship between the customership and the share of foreign personnel. The customership is mostly insignificantly related to economic performance, although the results vary depending on the methods applied. In most cases, there is no statistically significant impact on a firm's performance, although the results are somewhat inconsistent depending on the methods and data. Finally, there appears to be no evidence of synergy effects between Finpro services and the subsidized funding obtained from Finnvera, Tekes or the Ministry of Economic Affairs and Employment.

## RELATED LITERATURE

What is the impact of export promotion agencies (EPAs) on the exports of companies and how should the agencies be organized within the institutional framework? Lederman, Olarreaga, and Payton (2010) study the impact of EPAs at the country level, covering 103 developed and developing markets and including Finland. They provide evidence that on average, EPAs have a statistically significant effect on exports. The estimates of their study indicate that a 10 percent increase in EPA budgets results in a 0.6–1 percent increase in exports, taking into account the endogeneity issues and selection bias. However, the authors caution that these rather high average returns as such do not provide a justification for those budgets in terms of welfare because they lack the measures of externalities and net benefits related to

export promotion and because a better return for money might be obtained elsewhere. Their study highlights the importance of EPA services for overcoming trade barriers and solving the problems of asymmetric information. According to their findings, EPAs appear to be more effective when they are most needed, that is, when the exporter faces trade barriers abroad or faces informational asymmetries related to trading heterogeneous goods.

Regarding the institutional setup, Lederman *et al.* (2010) find that EPAs with a larger share of executive board members from the private sector but with a larger share of funding from the public sector appear to be associated with higher national exports. They also find evidence suggesting that the number of (decentralized) agents dedicated to exports is negatively correlated with exports, suggesting that a single strong export promotion agent is better than several lesser ones. However, there are decreasing returns to scale in resources dedicated to export promotion, suggesting that small is good in terms of EPA size.

# FINNVERA

## ROLE

Finnvera is a state-owned specialized financing company and the official Export Credit Agency. Finnvera provides financing for companies during various stages of their lifecycle—start, growth and internationalization—and provides guarantees against risks arising from exports. Finnvera has been given a mission to cure market failures in the supply of financial services, as stated in the law that governs the operations of the company.[11] According to the website of the company, Finnvera aims to strengthen the operating potential and competitiveness of Finnish enterprises. The financial instruments provided by Finnvera include loans, domestic guarantees, export credit guarantees and other services associated with the financing of exports. The risks associated with the financing provided for the client companies are shared between Finnvera and other financiers. The operations of Finnvera are steered by the industrial and ownership policy goals set by the State. These goals include the following: increasing the number of startups; providing financing for changes encountered by SMEs; and promoting the growth, internationalization and exports of enterprises. Finnvera's operations are expected to be self-sustainable over the long term. In the Team Finland network, Finnvera provides export credit guarantees and loans and guarantees for companies at various stages of internationalization.

## PREVIOUS EVALUATIONS

The evaluation of Finnvera in 2012 (Heinonen, Smallridge, Laaksonen, Stenholm, & Claes, 2012) assessed the following: 1) the strategy and objectives of the responsible ministry, 2) Finnvera's strategic activity in financial markets, and 3) the operational activity and

[11] Act on the State-Owned Specialized Financing Company (443/1998)

effectiveness of Finnvera. The findings of the evaluation suggested the following conclusions. First, the objectives set for Finnvera are operational rather than strategic. Second, the report considers Finnvera's intervention in the markets largely appropriate but notes that some of the products provided by the company appear to have a greater impact than others. Third, Finnvera applies numerous management practices to achieve desired results; it has exerted effort in improving processes and maximizing efficiency and productivity. Regarding the international role of Finnvera, the evaluation suggests that Finnvera's support is considered important for companies that aim to export and internationalize. However, while the level of importance varies depending on the export sector, buying country and terms, support is still provided across the board. The support is considered essential for companies facing competition from exporters from other countries.

The recent consulting firm evaluation from 2017, initiated by the Ministry of Economic Affairs and Employment (MEAE), provided a review of Finnvera's export operations (MEAE, 2017). The evaluation provided high grades for both the export operations and risk management of Finnvera. Based on the findings of the evaluation, the report suggested several recommendations, including the following. First, MEAE and Finnvera should consider activities to foster economic development, such as clearly defining and developing the long-term policy goals and boosting the efficiency and effectiveness of the operations. Second, the evaluation recommended that MEAE and Finnvera should improve the economic impact assessment of the company. This includes developing the criteria for innovation and competitiveness, adopting a holistic view of impact assessment and monitoring the longer-term economic impacts. Third, the report suggested guidelines to ensure sound risk management.

## RELATED LITERATURE

Rudolph (2009) provides a comparison of four state-owned financial institutions—BDC (Canada), BancoEstado (Chile), Finnvera (Finland) and DBSA (South Africa)—in terms of their mandate and corporate governance. The analysis finds similarities among these state-owned financial institutions from different countries. First, these institutions have an efficiency objective. Second, they have a professional management and proper risk management. Third, most of the institutions have direct bond market access. The analysis notes that Finnvera—despite the strong presence of bureaucrats and lobbyists on its board of directors and supervisory board—is run in a prudent manner. This observation is explained by cultural factors and sound laws that address the conflict of interest. Finnvera's weaknesses include the lack of prudential supervision and regulatory forbearance. However, these issues are to some degree offset by close monitoring by the government against short-term objectives.

The academic literature indicates that the past performance of development banks—and state-owned financial institutions more generally—has been, in general, disappointing, and the rationale of state-ownership has

been questioned (Berger, Clarke, Cull, Klapper, & Udell, 2005; Dinç, 2005; Iannotta, Nocera, & Sironi, 2007; La Porta, Lopez-De-Silanes, & Shleifer, 2002; Sapienza, 2004). The fundamental problem faced by state-owned financial institutions still remains: the mission of curing market failures while at the same time remaining financially viable. However, there has been a renewed interest in the state-owned financial institutions in recent years in the aftermath of the financial crisis. Gutierrez, Rudolph, Homa, and Beneit (2011) address the role of state-owned institutions within "The Sleeping Beauty" framework, in which the key element is latent readiness; this includes addressing presumed market failures in a limited scale during the normal times while standing ready to inject liquidity during credit crunch. However, the dual task of addressing both the long-term development goals and the short-term countercyclical role remains challenging to implement. While a constant presence of these institutions helps them to remain ready to act in crisis periods, the institutions should be periodically reviewed to ensure that they follow their mission and to evaluate whether their presence is justified. The potential countercyclical role of state-owned institutions would indicate both the expansion and contraction of their balance sheets throughout the credit cycle.

Export credit guarantee schemes assume market failures in the provision of insurance for long-term and large-scale projects. However, there exist very few firm-level studies analyzing the effects of export credit guarantees. Such evidence is needed for the evaluation of the effectiveness and welfare implications of the policies. Felbermayr, Heiland, and Yalcin (2012) study the real effects of export credit guarantees in Germany. They find evidence suggesting that the guarantees have a positive effect on both the sales and employment at the firm level. Furthermore, they find that the effect is larger during the financial crisis years. Heiland and Yalcin (2015) construct a model of international trade with heterogeneous firms, rationalizing the demand for state-provided credit guarantees by the cost advantage of the government over the private sector. Their empirical findings suggest that state credit guarantees provided in Germany indeed have a positive effect on exports. The effect is stronger for small firms, for the firms that are more dependent on external finance, for the projects of high value at risk, and during the periods of tight financial conditions in the private capital markets. Their findings seem consistent with the hypothesis that the credit guarantee schemes help to mitigate financial frictions.

## CONCLUSIONS

The previous evaluations of Team Finland and its individual members provide several key findings. First, the evaluation of Team Finland growth programs from 2016 suggested that the growth programs are a welcome tool for promoting the internationalization of SMEs but noted that it was too early to draw conclusions about their long-term effects (Salminen *et al.*, 2016). Second, the evaluation of Tekes from 2012 indicated that Tekes helps

firms to enter and expand in international markets—with a focus on growth companies having a capability to export—while priority, resources, and the strategic focus of international science and technology collaboration could be improved. Furthermore, Reid *et al.* (2016) suggest that Tekes has a distinct role in fostering new business ecosystems, while the longer-term effects require better synergies between the Team Finland network members. Third, the econometric evaluation of Finpro from 2011 found that the customership of Finpro is positively associated with internationalization and exports but found an insignificant effect on the share of foreign personnel, no effect on firm performance and a lack of synergy effects with other institutions (Hyytinen, Pajarinen, & Ylä-Anttila, 2011). Fourth, the evaluation of Finnvera from 2012 suggested that Finnvera is considered important for companies wishing to export and internationalize; however, the level of importance varies depending on the sector, buying country and terms. The recent consulting firm evaluation from 2017 covering Finnvera's export operations suggested that Finnvera has sophisticated export operations and risk management; however, the evaluation noted that the economic impact analysis of the company could be improved.

This section also reviewed the related academically oriented literature on government efforts to promote economic growth through the promotion of innovation and exports. The implications from the previous literature provide several highlights. First, the findings from the literature suggest that internationalization is driven by innovation; this indicates that the coordination and integration of internationalization and innovation policies should be under the same roof (Altomonte *et al.*, 2013). Second, the empirical evidence on export-led growth needs to be interpreted carefully due to selection problems. However, the scant recent evidence indeed suggests that export promotion activities have a positive effect on growth (Munch & Schaur, 2018; Olarreaga, Sperlich, & Trachsel, 2016). Third, the previous literature indicates that the economic rationale of export promotion relies on information asymmetries and externalities; in theory, they should operate through the *extensive* margin (Lederman *et al.*, 2016). However, there is also evidence that grants only affect already exporting firms (Görg *et al.*, 2008), suggesting that an in-depth evaluation of the rationales behind the public policies is called for. Fifth, the findings from the literature indicate that bank health and financial shocks affect exports more than they affect domestic sales (Amiti & Weinstein, 2011), raising a concern that exporters could be particularly vulnerable during times of financial instability in the markets.

# PRACTICES IN OTHER COUNTRIES

The following country descriptions present an overview of key organizations and highlights some instruments for promoting Innovation-led Export Growth (ILEG). This section builds on previous studies for the basic descriptions of systems (e.g. MEAE, 2016; Lahtinen *et al.*, 2017)

The approaches towards 'innovation-led export growth' are variable between countries and combine various elements of innovation funding and export supports. The following table condenses key features of innovation-led export growth support from selected other small advanced economies, Sweden, Denmark, the Netherlands, and Ireland. The selection was agreed with the steering group and the purpose is to compare experiences from countries with somewhat similar structure as Finland.

All countries except Finland a have an explicit export strategy that is in many cases intertwined with development cooperation to some degree at least. There is also clearly a range of standard services, most commonly information on target markets and possible regulatory or other trade barriers, and export credits or guarantees. Besides these basic services, the variety of instruments is larger and there are for example vouchers and various types of grants. Comparing the services offered in the comparison countries to Team Finland export programs, and the feedback discussed below, it seems that the program model is an efficient way to offer the services.

The simplest systems are found in Denmark, the Netherlands and Ireland, where the services a centralized to a limited number of organizations. In contrast, especially the Swedish system houses multiple adjoining actors. Between Finland and Sweden, the common thread is that there is a variety of agencies and other public actors that work in ILEG-related matters, and the feedback from prospective export enterprises is that the relationship and positioning between existing services is unclear. The response in Sweden has been to gather the actors under the umbrella brand Team Sweden, and in pilot regions the service providers have been collected to Export Centers. This approach is similar to Team Finland. Still the feedback is that the responsibilities and positioning to each other among the Team Sweden actors remains unclear, which confuses especially entrants to the system.

Looking at the features that stand out in relation to development of Team Finland, one is the simplicity of organization in Denmark, the Netherlands and Ireland. The latter is perhaps the most integrated system, with an inter-ministerial strategy and integration of all rele-

vant services in one organization. Also, the communication and materials from Enterprise Ireland are communicative: simple, transparent, and easy to approach.

Out of specific instruments, the Danish VITUS program that could be described as the "Danish NIY-program for exports" stands out as an interesting instrument to accelerate a small number of motivated SMEs towards international markets in a short time window. However, the program is quite involved with the review panel and a consultant who is embedded in the organization.

Another interesting example is the international sales training offered by Enterprise Ireland. The service includes several stages from a series of workshops through to a graduate program and a 10-week course package, designed with a higher education organization.

**TABLE 1.** Summary of innovation-led exports support in comparison countries (adapted from Lahtinen *et al.*, 2017)

| | FINLAND | SWEDEN | DENMARK | THE NETHERLANDS | IRELAND |
|---|---|---|---|---|---|
| **Strategy/ policy** | Team Finland does not have a specific strategy but it is steered based on Government priorities.<br>Prime Minister's Office has moved the responsibility for coordinating Team Finland towards Ministry of Economic Affairs and Employment, and present Business Finland as implementing agency. | Ministry of Economic Affairs and Ministry of Foreign Affairs steer policy.<br>Strategy is set in Sweden's Export Strategy.<br>Team Sweden coordinates between the 19 constituent organizations, including ministries, public enterprises, and other actors involved in supporting ILEG. | Ministry of Foreign Affairs is responsible for the policy and The Trade Council.<br>The strategy is set in a general Export Strategy, and in a new energy sector specific export strategy. | Ministry of Foreign Affairs coordinates 'economic diplomacy', development cooperation and exports.<br>Export strategy is interwoven with development policy and strategy.<br>Dutch Trade and Investment Board gathers the major stakeholders from industry and government to develop a joint vision and pool resources.<br>Ministry of Economic Affairs implements economic policy in concert with export strategy. | Department of Business, Enterprise, and Innovation is responsible for exports promotion policy. Department of Foreign Affairs and Trade is in charge of monitoring the policy however.<br>The Connected Ireland strategy is a cross-ministerial strategy for economic development, innovation, and exports. |

**... TABLE 1.**

| | FINLAND | SWEDEN | DENMARK | THE NETHERLANDS | IRELAND |
|---|---|---|---|---|---|
| **Domestic services** | Team Finland offers information and program activities, as well as funding in the form of RDI grants, loans and guarantees.<br>Team Finland network is active in contacting, coaching and mentoring enterprises and TF organizes marketing events and roadshows<br>Team Finland Market Opportunities online service offers leads and market opportunities<br>Exports programs offer market information<br>Embassies and consulates produce country reports.<br>Tailored service proposition model and common communication channel between members in Team Finland has been launched 2016. | Team Sweden is an umbrella for various service providers: including information, consultancy and advisory, specific export programs, and loans and guarantees.<br>Business Sweden offers both free and tailored information as a paid service<br>Tilväxtverket offers an overview to the services through a portal.<br>New clients enter Steps-to Export program where the services are tailored between different providers under Business Sweden Umbrella. | Trade Councils offer a range of services from information to advisory. The flagship program is VITUS for accelerating international growth of ambitious SMEs.<br>The Trade Council coordinate with regional Vaeksthus who have complementary services especially for SMEs that are offered in concert with regional actors.<br>The regions have responsibility for development of industry and activation. | The ministries have largely delegated offering the services to RVO (Rijksdienst voor Ondernemend Nederland).<br>RVO has a service voucher scheme (SIB) for initial development of exports, a consortium-based export scheme (PIB) particularly for the top sectors, and two export loan and credit, as well as guarantee facilities (DTIF, and EKV). | The services are highly concentrated to Enterprise Ireland, which offers basic information services, as well as grant funding for exporters.<br>Differing from other countries, Enterprise Ireland offers multiple levels of training and education for international sales. |
| **Services in target markets** | Trade/economic diplomacy is gaining importance.<br>Team Finland has an office network, including consulates, and RDI offices in key locations. | Business Sweden offices in 47 countries offer consultancy. | Innovation Centre Denmark in specific innovation hub locations<br>Trade Council offices and consulates offer services. | Embassies, consulates and NSBO offices offer services in target countries. | The network of embassies and the International Office Network offers local market information and contacts. |

# SWEDEN

The responsibility over export is split between **Ministry of Foreign Affairs** that has dedicated unit for exports promotion and trade diplomacy and **Ministry of Economic Affairs**. However, the responsibility has been recently consolidated under the Minister of Economic Affairs. (Statskontoret, 2016)

The actions for promoting innovation-led export growth (ILEG) are based on *Sweden's Export Strategy* (The Government of Sweden, 2015a), which is built in collaboration between export industries and public sector. The main goals are to grow both absolute volume and relative share of exports, promote Sweden for investors, boost work-related migration, attract tourists, raise the number of exporting enterprises, and increase Swedish contribution to international trade. The strategy also sets a framework for the following public services; information to support internationalization and exports, market information, information about exports promotion activities, contacts for buyers, procurement networks and decision makers, building joint offerings, and assistance with trade barriers.

**Team Sweden** was founded in 2015 to gather relevant public actors in the field of ILEG under one brand and to coordinate activities. Team Sweden is led by an Undersecretary of State in the **Ministry of Economic Affairs**. Team Sweden's mission is (The Government of Sweden, 2015b) to share expertise around internalization and exports promotion, identify Swedish products, services and solution for international markets, coordinate actions for internationalization and exports promotion, and coordinate between public organizations and the industries. The impetus for the founding of Team Sweden was that enterprises have signaled the whole system and network of actors for exports promotion was too complex. (c.f. Statskontoret, 2016).

A secretariat of Team Sweden matters has been set up at the Ministry for Foreign Affairs Department for the EU Internal Market and the Promotion of Sweden and Swedish Trade. (The Government of Sweden, 2015b) However, Team Sweden works in collaboration with the Minister of Enterprise and Innovation (The Government of Sweden, 2015a). In a similar collaborative fashion, the Team Sweden foreign offices are housed with the embassies.

In practice, Team Sweden is a brand and an umbrella organization for the following actors: Business Sweden, Swedish Research Institute RISE, VisitSweden, ALMI, Growth Analysis, Swecare, Tillväxtverket, Swedish Board for Accreditation and Conformity Assessment, Swedish Customs, Swedish Energy Agency, Swedish Environmental Protection Agency, Swedish Environmental Research Institute, Swedish Export Credit Corporation (SEK), The Swedish Export Credits Guarantee Board (EKN), The National Board of Trade, Vinnova, Ministry of Culture, Ministry of Education and Science , Ministry of Economic Affairs, Ministry of Foreign Affairs, Ministry of Treasure, and Ministry of Social affairs and Public Health. (The Government of Sweden, 2015b)

**Business Sweden** is a Public-Private partnership owned by the state and industries, which started in the present form after merger of Invest Sweden and the Exports Board (Exportrådet) 2013 (Business Sweden, 2017a). Business Sweden is described as a partnership that offers relevant networks all over the world for its constituents. The high-level-goals are to promote exports and create jobs, growth and welfare. Business Sweden has a government mandate to offer basic export and invest-in services, conceived as information services; se well as specific programs for development and internationalization of SMEs, and targeted export activities and marketing of strategic industries. In addition, Business Sweden can buy consultant services for its customers. The largest area of activity have been basic export services, SME support and targeted activities, although in year 2017 particular focus was paid on invest-in activities (Business Sweden, 2017b)

**Almi Företagspartner AB** is a national network with a mission to support entrepreneurship and SMEs. The main instrument is loans for various development, internationalization and exports projects. Almi Invest offers risk investments. Additionally Almi offices offer consultancy and advisory for starting up, innovation, growth, and internationalization directly and mentorship and courses. (Almi, 2017)

The Swedish Export Credits Guarantee Board **EKN** offers guarantees for enterprises and banks for exports and international trade risk (EKN, 2017) and -the Swedish Export Credit Corporation **SEK** offers export credits and loans for exporters, as well financing for export customers, in collaboration with other financial institutions. EKN and SEK work together with commercial banks and are able to finance both exporting enterprises, their customers and suppliers with competitive rates. (SEK & EKN, 2017)

The Swedish Innovation Funding agency **Vinnova** promotes innovation Sweden with program funding, grants and supporting participation to Horizon 2020 the Framework Programme for Research and Innovation. Vinnova additionally is in charge of the national business incubation program, and offers specific programs for internationalization of SMEs, for example a TINC (TechINCubator) program at the Nordic Innovation Center in Palo Alto.(Statskontoret, 2016; Vinnova, 2017).

Two more additional agencies related to growth promotion are **Tillväxtverket** – The Swedish Agency for Economical and Regional Growth and **Tillväxtanalys** – Growth Analysis. The role of Tillväxtverket is largely to offer information, and to an extent the information portal run by it acts as a (virtual) one-stop-shop for ILEG promotion. Tilväxtanalys in turn is an expert organization that specializes in growth analysis, evaluations and impact assessment and it supports for its own part promotion of growth and innovation. (Statskontoret, 2016)

Besides there national actors, multiple regional actors, one of the largest being **Invest in Skåne** and **Göteborg Business** region, run parallel services that forward the interests of the regions in terms of attracting investment and promoting ILEG.(Statskontoret, 2016; Business Sweden, 2017b)

Altogether the variety of actors who work in ILEG promotion in Sweden is wide, Team Sweden houses 19 different actors under its umbrella and this has been a frequent subject of critical feedback. Team Sweden is expected to clarify the picture somewhat, but the situation has also given the Government a reason to initiate a project to examine the possible service overlaps between Almi, Energimyndigheten, Growth Analysis/Tillväxtanalys, Business Sweden, Swecare, Tillväxtverket, Vinnova and VisitSweden. (Statskontoret, 2016)

## DENMARK

The main responsibility over trade and exports in Denmark is with the **Ministry of Foreign Affairs**. The actions are steered by a *'Government Strategy on Export Promotion and Economic Diplomacy. More trade. More Jobs.'* (The Danish Government, 2014). The goals laid out in the strategy are: reinforcing exports promotion programs and improving the availability for enterprises; inter-ministerial action to forwards Danish economic interest; putting an emphasis on growth and employment in diplomacy and international relations; programming Trade Council actions together with the industries; improving global representation in growing markets; better cohesion between development cooperation and international trade; improving enterprise funding; increasing internationalization and exports from SMEs; developing effective and industry-centric exports promotion campaigns. The strategy contains altogether 40 planned actions between 2014 and 2020 to implement the strategic goals. Additionally, a new export strategy was launched 2017 specifically for energy technologies, with emphasis on sustainability and green energy, and development cooperation (Udenrigsministeriet, Energi- Forsynings - og Klimaministeriet and Erhvervsministeriet, 2017).

Operatively, the main responsibility for ILEG and invest in –activities is with the **Trade Council**, which operates in collaboration with the Ministry of Higher Education and Science and the Ministry of Foreign Affairs of Denmark (Ministry of Foreign Affairs of Denmark, 2014) The activities are integrated also to other MFA agencies, including Invest in Denmark, DANIDA, and embassies and consulates. Additionally, international trade relations are a cross-cutting theme in diplomacy. (Lahtinen *et al.*, 2017; Ministry of Foreign Affairs of Denmark, 2017)

The main operations of the Trade Council are internationalization and export growth, improving international business skills, innovation, and Invest-in-Denmark activities. The Council offers both free and paid services, and specific action for SMES. Trade Council services include exports coaching program (implemented regionally), market development and entry service, including market reports and developing relations nationally and through consulates, customer intelligence and procurement, and legal/regulatory advisory on customs, import/export licenses logistics, and other documentation. The Trade Council collaborates with **Innovation Centre**

**Denmark** to offer information and advisory services, and support for innovation and business development. (Udenrigsministeriet, 2017)

The five regions of Denmark are charged with organizing healthcare and welfare services, and development of industry. Every region has a development corporation, which is funded jointly by the state through National Agency of Enterprise and Construction and the region. One example is *Væksthus Copenhagen,* (Growth House) which offers support for market development, internationalization, research, development and innovation, and general business development. Vaeksthus Copenhagen collaborates with financiers, investors, municipal business services, lawyers, and the Trade Council. (Vaeksthus Copenhagen, 2018)

Along the path of export services, Trade Council has a flagship program for SMEs that show potential to expand into the global markets. The VITUS program was founded 2010 and the main target are SMEs with a market tested product and international ambition and potential. The program is open for 10 enterprises in 2018. The specific quantitative criteria for attending have been raised for 2018, and participants need to have less than 250 employees and turnover less than DKK 375 M (approx. EUR 50 M) (raised from a previous 5-100 employees and turnover less than DKK 150 M or approx. EUR 20 M). The enterprises are chosen by an independent review panel. The program has two phases, strategy (3-4 months) and implementation (8-9months). In the first phase the advisors will get familiar with the enterprise and the products and services. The advisor and the enterprise form an export strategy, including a fact-finding mission to the target market and two workshops with facilitators who are familiar with the industry and target market. At the end of the strategy phase, the strategy is evaluated by a panel of experienced business managers. The second phase entails implementing the planned activities with coaching and mentoring from the advisor. (The Trade Council, 2017; Trade Council, 2018)

## THE NETHERLANDS

The Dutch ILEG activities are highly integrated in the foreign and development policy. The **Ministry of Foreign affairs** is in charge of coordination of diplomacy and trade relations, as well as development cooperation. The development cooperation and international trade or exports promotion agenda are intertwined at the policy level and international trade and development strategies are the same document, where the goals are to eradicate poverty, support inclusive growth and ensure international success of Dutch enterprises internationally. Historically the Netherlands have benefitted from international trade and have been active party in world trade ever since the Golden age in 17$^{th}$ century. The ILEG policy is well aware that the Netherlands is dependent on global economy and trade. (Ministry of Foreign Affairs of the Netherlands, 2013)

In addition to the ministries, of the most important organizations related to ILEG activities is the **Dutch Trade and Investment Board (DTIB)**. The main activities of DTIB include drawing the main actors of the innovation system, including representation from Ministries of Foreign Affairs, Economic Affairs, central Trade and Labor Unions, the Top Sectors, as well as regional and municipal authorities together to develop a common vision and pool resources. Key issues include the internationalization of the top sectors, the business climate in the Netherlands, coordination of the strategic travel agenda, internationalization of SMEs, free trade agreements, corporate social responsibility (CSR), export financing and the aid and trade agenda. (Government of the Netherlands, 2015)

While the trade policy is the field of the MFA, **Netherlands Enterprise Agency (Rijksdienst voor Ondernemend Nederland, RVO)** implements the ILEG instruments. The particular foci of RVO are sustainable and innovative business and development of agribusiness. The services include innovation funding and various internationalization services. The **Partners for International Business (PIB)** is aimed for the top sectors and has three modules, promotion and matchmaking, knowledge exchange and networking, and economic diplomacy, which together aim to supports a consortium of enterprises in defining a joint plan or strategy for market entry, gathering market intelligence, and helping to overcome trade barriers.(RVO, 2018c)

Under exports **Dutch Trade and Investment Fund (DTIF**) is an export guarantee and loan facility (RVO, 2018b). DTIF is parallel with the Dutch Good Growth Fund that focuses on middle-income countries (Ministry of Foreign Affairs of the Netherlands, 2013). The DTIF budget is rather limited, and there is a larger export credit and guarantee facility **(Exportkredietverzekering, EKV)** that is operated by Atradius Dutch State Business together with financial sector, in a similar fashion as the Swedish system (Rijksoverheid, 2018).

The Ministry of Foreign Affairs has also commissioned the RVO to implement a subsidy scheme for demonstration and investment to emerging markets (DIH). Another specifically export instrument is **Starters International Business (SIB)** voucher scheme, that offers individual vouchers for individual coaching on international business and exports development, collective activity vouchers for joining trade delegations or fairs, and knowledge vouchers for legal or accountancy consultations. (RVO, 2018d) In the foreign markets, the offering between MFA and RVO form a common network between the embassies and consulates Netherlands Business Support Offices (NBSO). (RVO, 2018a).

# IRELAND

While Ireland has a ministry named **Department of Foreign Affairs and Trade**, the substantive issues in trade policy and economic policy are the responsibility of **Department of Business, Enterprise, and Innovation**. The main role of the Department of Foreign Affairs is monitor the *'Ireland Connected'* strategy in collaboration with other relevant ministries, and to support exporting activities and trade missions. (Department of Foreign Affairs and Trade, 2018)

The key policy document is 'Ireland Connected' (*Ireland Connected: Trading and Investing in a Dynamic World*, 2017) that lays out the overall framework for economic and trade policy. The key goals are to increase indigenous growth and diversify export markets, create more jobs, and attract more foreign investment and foreign students. The strategy recognizes the embassy network; Enterprise Ireland; IDA Ireland, the invest-in agency; Bord Pia, a specific agribusiness promotions agency; Science Foundation Ireland; Tourism Ireland, Education Ireland, and Film Board Ireland.

The central agency in implementing ILEG-related measures is **Enterprise Ireland**. Differing from the other examined countries, Enterprise Ireland offers a full spectrum of enterprise development services from business development and innovation funding to exports support (Enterprise Ireland, 2017). The portfolio exports promotion includes information services that include a dedicated Market Information Center, an international office network, trade missions, and international sales training ranging from workshops to a graduate program and a tailored 10-month education designed together with Dublin Institute of Technology. The service offering for potential exporters is through a 'help desk' who have a variety of services from simple coaching with initial assessment of export readiness and business plan, to events and contacts. (Enterprise Ireland, 2018b) For enterprises appraised eligible, there is a range of progressively increasing grants from 'Be prepared' and Strategic Market Review grants through to Market Access and Internationalization grant, complemented with the already listed services. (Enterprise Ireland, 2018a).

# FIRM-LEVEL ANALYSIS

We find that nearly half of the internationally oriented small and medium-sized firms were supported by at least one of the organizations of Team Finland during the years from 2009–2015. In addition, we observe that there has not been any large-scale "feeding" of newly supported firms from one organization to others. Compared to the non-treated and internationally oriented SMEs, the firms treated by the organizations of Team Finland are younger, more export-intensive, and more likely to have workers in innovation-related tasks, and their labor productivity is lower on average. The treatment effects on the foreign operations of the firms were negligible in the case of all Team Finland organizations. Furthermore, the firms treated by Finnvera improved their performances regarding labor productivity in Finland, the firms treated by Finpro or Tekes performed well with respect to employment growth in Finland, and the clients of Finpro also improved their sales growth.

In this section, we analyze the characteristics and effects of the interventions and support activities of the Team Finland organizations with respect to internationally oriented small and medium-sized firms over the years from 2009–2015.

## TARGET POPULATION

In this section, we focus on internationally oriented small and medium-sized firms. The small and medium-size enterprise (SME) criterion is based on the Eurostat/Statistics Finland definition according to which a firm is defined as an SME if it has fewer than 250 workers and either has turnover not exceeding 50 million euros or total assets not exceeding 43 million euros. Moreover, it has to conform to the independence criterion. The independence criterion refers to those firms that do not have 25% or more of their capital or voting rights owned by one firm or jointly by several firms and that fall outside the definition of an SME. However, due to the data issues and nature of the phenomenon, we exclude micro firms (i.e., firms employing less than 10 workers and having turnover or total assets less than 2 million euros). In addition, we define a firm as being internationally oriented if it

- exports goods or services from Finland,
- has foreign turnover, or
- workers abroad.

The source of data is Statistics Finland, and the period of the study is from 2009–2015.

**FIGURE 1.**
Description of the target population.
Data source: Statistics Finland.

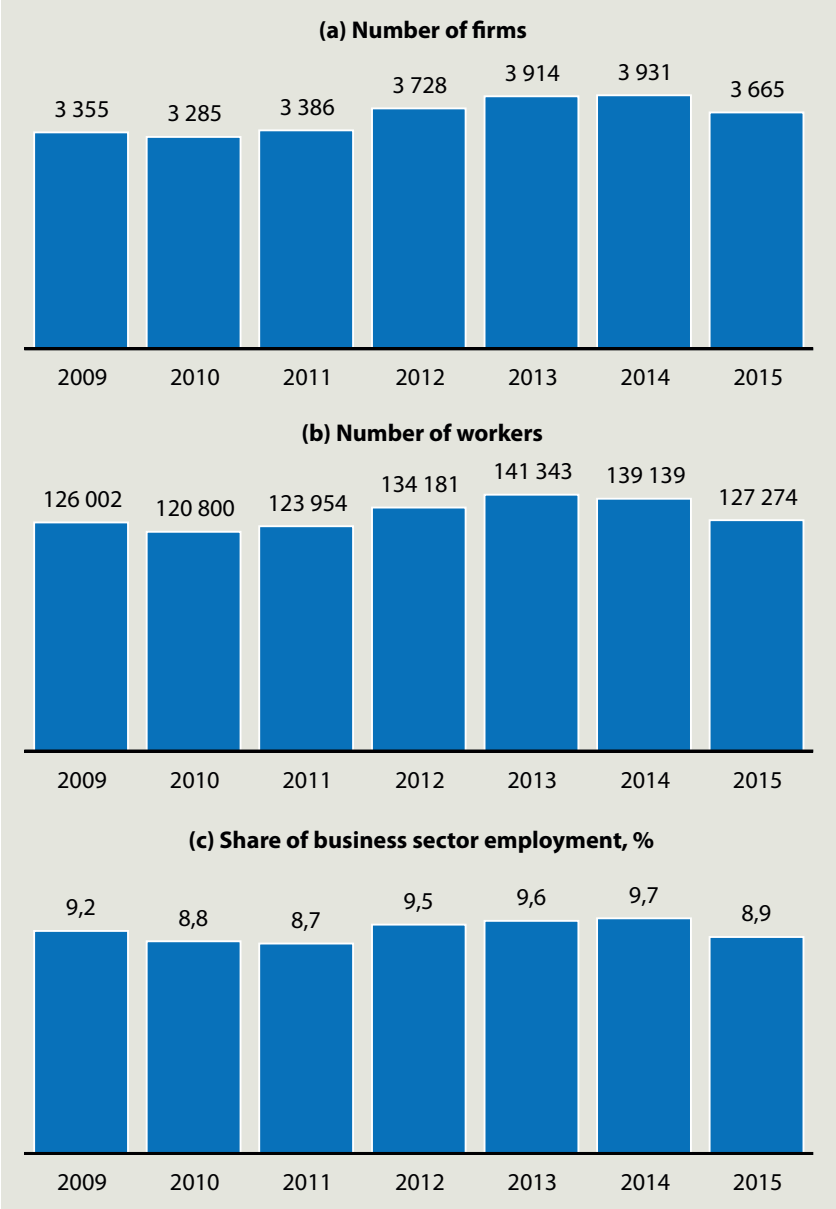


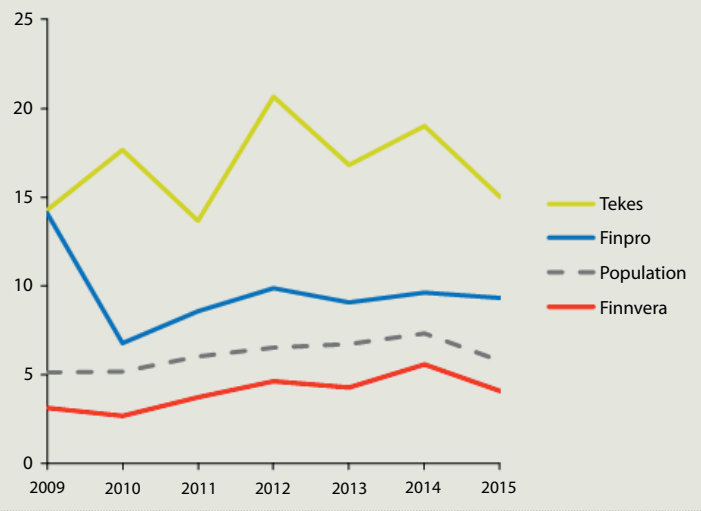

Figure 1 depicts the development of the target population of the study from 2009–2015. We can see that the number of firms increased slightly over the years until 2014, when there were 3931 total internationally oriented SMEs. In 2015, the target population decreased by 266 firms, but there were still 310 firms more than in 2009.

Internationally oriented SMEs employed in total 126002 workers in 2009 and 127274 workers in 2015. They accounted for 9.2% of total business sector employment in 2009 and 8.9% in 2015. Their share of business sector employment was the highest in 2014, amounting to 9.7%. The share was the lowest in 2011 at 8.7%.

### Are IT-services the Finnish exports unicorn?

According to a recent report conducted by a consortium of Finnish researchers (Haaparanta, *et al.* 2017), the absolute and relative volume of service exports has increased significantly since the beginning of the new millennium. Altogether service exports accounted for 36 % of the total value added of Finnish exports in 2016, while the corresponding share in 2002 was 20 %. In the study the researchers utilize a new methodology for more detailed information on the Finnish exports using micro level commodity and company value added data.

While several factors contribute to the increased importance of services exports, especially the volume




The share of IT services firms in the target population by supporting organizations.

of IT-services exports has boomed within the past 5 years: In fact, the crash of Nokia that cut around 5 billion from the value added based exports was replaced within two years by the increase of the value added of IT-service exports. In 2016, IT-services were the second largest exports commodity group (11.4 % of the total value added of Finnish exports), preceded by the traditional giant, paper products (13 %).

In the IT-sector services accounted for more than a half of the gross value of exports in 2015. While the value added of IT-goods export has plummeted from 9 to 4 billion euros in 2007-2016, the value added of IT-services exports has been able to narrow the exports gap of the IT-sector: the domestic value added of IT-services rose within the same period from nearly zero to more than 5 billion euros. This development during the economic crisis that hit Finland extremely hard is exceptional and contradictory to the development of nearly all other industries. However, it must be noted that IT-services exports are hardly produced only at the IT-services industry: the use of commodity-level statistics shows that IT-services are produced across several industries, including the "traditional" industries such as machinery.

While the increase of IT-services exports is important and undeniable, some critical remarks have been made concerning the vulnerability of the branch. While the report does not sift out single companies, the importance of single players is significant: alone the value added of Nokia in 2015 was more than 2 billion, and the value added of the mobile game company Supercell was nearly one billion (Ali-Yrkkö, Seppälä and Mattila 2016).

In this impact study concerning Team Finland, we have been using the goods exports data from the Statistics Finland, due to the lack of ready-to-use and comprehensive services export data. However, the IT-services sector is included in the population of this evaluation. As the figure below depicts, approximately 5–7% of all internationally oriented SMEs are in the IT services sector.[12] By organization, the share of IT services firms of all supported firms is the largest in the case of Tekes; the percentage varies in the range of 14–21%. From Finpro's clients, nearly 10% have been in the recent years from the IT services sector. Only in the case of Finnvera, the share of supported IT services firms has been systematically below the corresponding share in the target population.

[12] IT-services have been classified based on the recommendation of OECD(2006). They include the following TOL-2008 classes: 4651, 4652, 582, 61, 62, 631.

# PUBLIC INTERVENTION

In this section, we first study the magnitudes of the interventions of each of the three public support organizations in our target population. We also tackle the characteristics of the supported firms and compare them to the rest of the population. After that, we analyze the interactions of the organizations in their supporting activities.

From the three organizations of the study, Finnvera had the largest number of internationally oriented SMEs in its "supporting flow" (see Figure 2). The number of firms varied in the range of 398–539 each year. From the target population, 10–16% of the firms were supported by Finnvera. The share was the largest in 2009 and the lowest in 2013. Since then, the percentage has been increasing, and it was 13% in 2015.

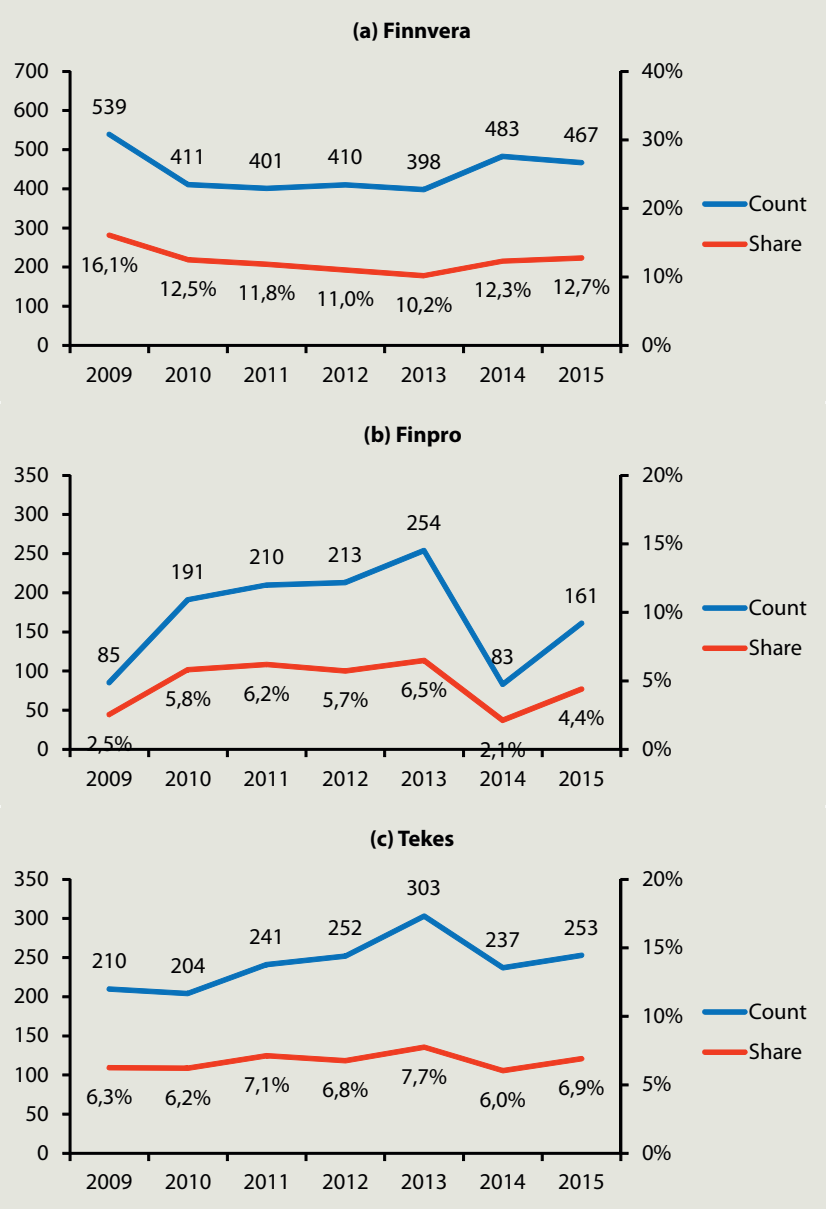
Tekes is the second largest support organization measured by the number of supported firms. It has made interventions in 204–303 internationally oriented SMEs each year. Its support reached 6–8% of the target population each year. The proportion has been rather stable over the years. In 2015, approximately 7% of the target SMEs received injections from Tekes.

Finpro experienced the most dispersion over the years in the number of the supported firms. The number of internationally oriented SMEs using its services varied in the range of 83–254 from 2009–2015. The number was the highest in 2013 and the lowest in 2014. From the target population, the share of firms using Finpro's services was in the range of 2–7%. One reason for the large dispersion is that there was some restructuring in Finpro's functions. Data on the years from 2009–2013 is based on the yearly billing information. In this period, our data cover those internationally oriented SMEs that bought Finpro's services by at least 2000 euros per annum. In 2014, the commercial consulting services were sold to Soprano Oyj. That is why we do not have fully comparable billing data available for 2014 and 2015. Instead, data on these years are primarily based on information of firms that were active in various Finpro's non-profit programs.

In Figure 3, we summarized the average amounts of public support for the internationally oriented SMEs by organization from 2009–2015. The left column of the figure depicts the average support per firm, and the right column the average support per worker. For both distributions we have reported the $10^{th}$, $50^{th}$ and $90^{th}$ percentiles.

The median amount of Finnvera's loans and guarantees granted to the target population over the years from 2009–2015 was approximately 367 thousand euros. The median value did not vary substantially over the observation years. In 2009, the median was 395 thousand euros, and it was 396 thousand euros in 2015. Instead, the value of the $90^{th}$ percentile somewhat increased. In 2009, it was 1.8 million euros, and it was 2.1 million euros in 2015. On the other hand, the $10^{th}$ percentile dropped from 101 thousand euros in 2009 to 80 thousand euros in 2015. These trends are also visible when we analyze the support per worker. In this case, the median was rather stable at 13 thousand euros. The $90^{th}$ percentile has increased from 61 thousand euros in

**FIGURE 2.**
The number of supported firms and their shares of the target population.
Data source: Statistics Finland.




2009 to 79 thousand euros in 2015, and the 10th percentile decreased from 4.2 thousand euros to 3.5 thousand euros during the same period.

The median amount of Finpro's commercial sales to the internationally oriented SMEs was 13 thousand euros both in 2009 and 2014. (No comparable data were available for 2015.) The 90th percentile varied in the range of 38–52 thousand euros without any clear trend. The 10th percentile was stable at 3–4 thousand euros. Measured by workers, the median sales to the target population slightly decreased from 400 euros in 2009 to 300 euros in 2014. The 90th percentile also decreased slightly from 1.9 thousand euros in 2009 to 1.7 thousand euros in 2014. The 10th percentile was steady at 100 euros.

The median value of the subsidies and loans to internationally oriented SMEs granted by Tekes decreased quite notably from 205 thousand euros in 2009 to 100 thousand euros in 2015. Additionally, the 90th percentile of the distribution decreased from 905 thousand euros in 2009 to 673 thousand euros in 2015, and the 10th percentile decreased from 44 thousand euros to 22 thousand euros, respectively. The median value of subsidies and loans per worker in the target population granted by Tekes was 5400 euros in 2009 and 3900 euros in 2015. The 10th percentile decreased from 900 euros to 400 euros, respectively. The 90th percentile varied over the years, but in this case, there has not been any clear downward trend. Instead, in 2015, the 90th percentile was slightly higher (33 thousand euros) than in 2009 (28 thousand euros).

**FIGURE 3.**
The average amounts of public support by organizations in 2009–2015.
Data source: Statistics Finland. The nominal amounts have been deflated by the GDP deflator (2015= 100).

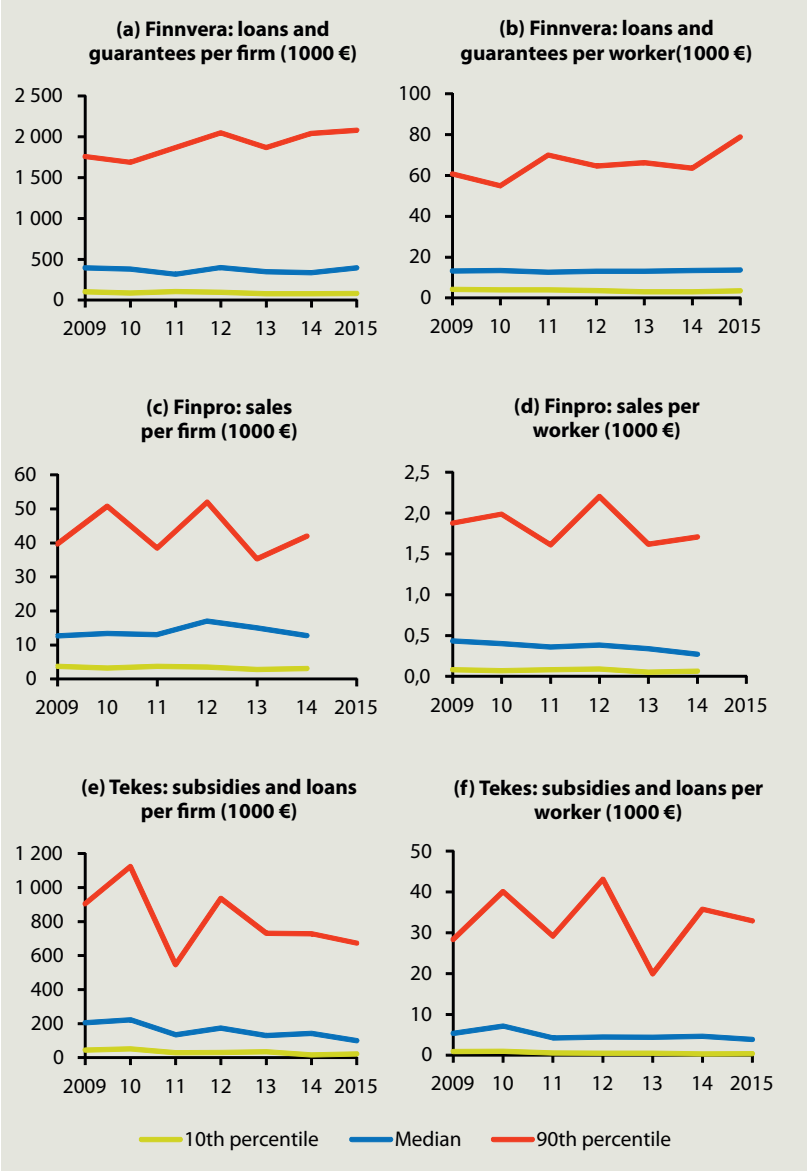



Table 2 depicts the characteristics of the supported firms in comparison to the rest of the population of internationally oriented SMEs in 2009. We note that the supported firms are younger, more export intensive and more likely to have workers in innovation related tasks than other internationally oriented SMEs, on average. Moreover, their level of labor productivity is lower, on average. This observation hints that the supported firms may be more likely than the target population's other firms in an investment phase. In other words, they are investing in human capital and other factors of production more heavily than their value added is growing.

In addition, the internationally oriented SMEs supported by Finnvera are smaller in terms of turnover in Finland, on average. Conversely, the firms supported by Finpro or Tekes are larger (measured by employment in Finland). Furthermore, the firms that have received injections from Tekes are more likely to have employees abroad than the other internationally oriented SMEs. In terms of the magnitude of foreign employment or turnover, there are no significant differences between the firms supported by Tekes and the target population's other firms. The same observation holds regarding the analysis of the firms supported by the other two organizations.

**TABLE 2.** Supported firms compared to the target population's other firms in 2009.

| | FINNVERA | FINPRO | TEKES |
|---|---|---|---|
| Firm age | Younger** | Younger*** | Younger*** |
| Employment in Finland | No diff. | Larger** | Larger*** |
| Employment abroad | No diff. | No diff. | No diff. |
| Has empl. abroad (1/0) | No diff. | No diff. | Larger** |
| Turnover in Finland | Smaller*** | No diff. | No diff. |
| Turnover abroad | No diff. | No diff. | No diff. |
| Labor productivity | Lower*** | Lower* | Lower*** |
| Goods exports | Larger*** | Larger*** | Larger*** |
| Goods exports/turnover | Larger*** | Larger*** | Larger*** |
| Share of innovators | No diff. | Larger* | Larger*** |
| Has innovators (1/0) | Larger*** | Larger*** | Larger*** |

Data source: Statistics Finland. The table summarizes the results of t-tests for means. Statistical significance is indicated by *** p<0.01, ** p<0.05 and * p<0.1. No diff. indicates that the means between the supported firms and the target population's other firms do not differ at p<0.1.

Next, we look at interactions of the three organizations in supporting the activities of internationally oriented SMEs. We analyze the interactions from year t–1 to year t+1. Figure 4 depicts an example of the possible temporal combinations of outcomes when a firm has received support from two different organizations during t–1 to t+1. In this case, there are nine possible temporal combinations. In the case that a firm has received support from all three organizations, there are in total 27 possible temporal combinations. Our time period covers the years from 2009–2014 in this analysis.

Figure 5 summarizes the interactions of the organizations with respect to support for the target population's firms. When we first look at the combinations of the two organizations (charts a–c; we do not control if the third organization was also involved in the same time period), we find that in all three cases, the number of supported firms has increased substantially over the years. The most common type of support combination was Finnvera and Tekes. In the target population, 4% received support from both of these organizations during t–1 to t+1 in the first observation year and 12% in the last observation year, accounting for 472 firms in the last year. The next most common combination was Finpro and Tekes. The share of supported firms of the target population increased from 3% during t–1 to t+1 in the first observation year to 10% in the last observation year, accounting for 397 firms in the last observation year. The share of supported firms in the combination of Finnvera and Finpro increased from 3% during t–1 to t+1 in the first observation year to 8% in the last observation year, accounting for 329 firms in the last year.

From part (d) of Figure 5, we see that 29% of the target population's firms were supported by at least one organization during t–1 to t+1 in the first observation year and 44% in the last observation year. A total of 1749 internationally oriented SMEs were supported during t–1 to t+1 in the last observation year by at least one organization. The combination of all three organizations together is rather rare in this population. Only 1% of firms were supported by the all three organizations during t–1 to t+1 in the first observation year and 6% in the last observation year.

**FIGURE 4.** The possible combinations of outcomes in the case of firms that have been supported by two organizations during t–1 to t+1. Source: Authors' sketch.

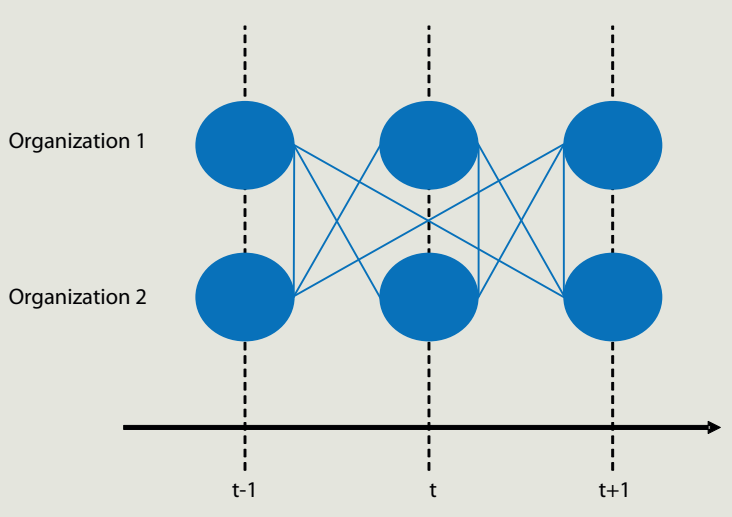
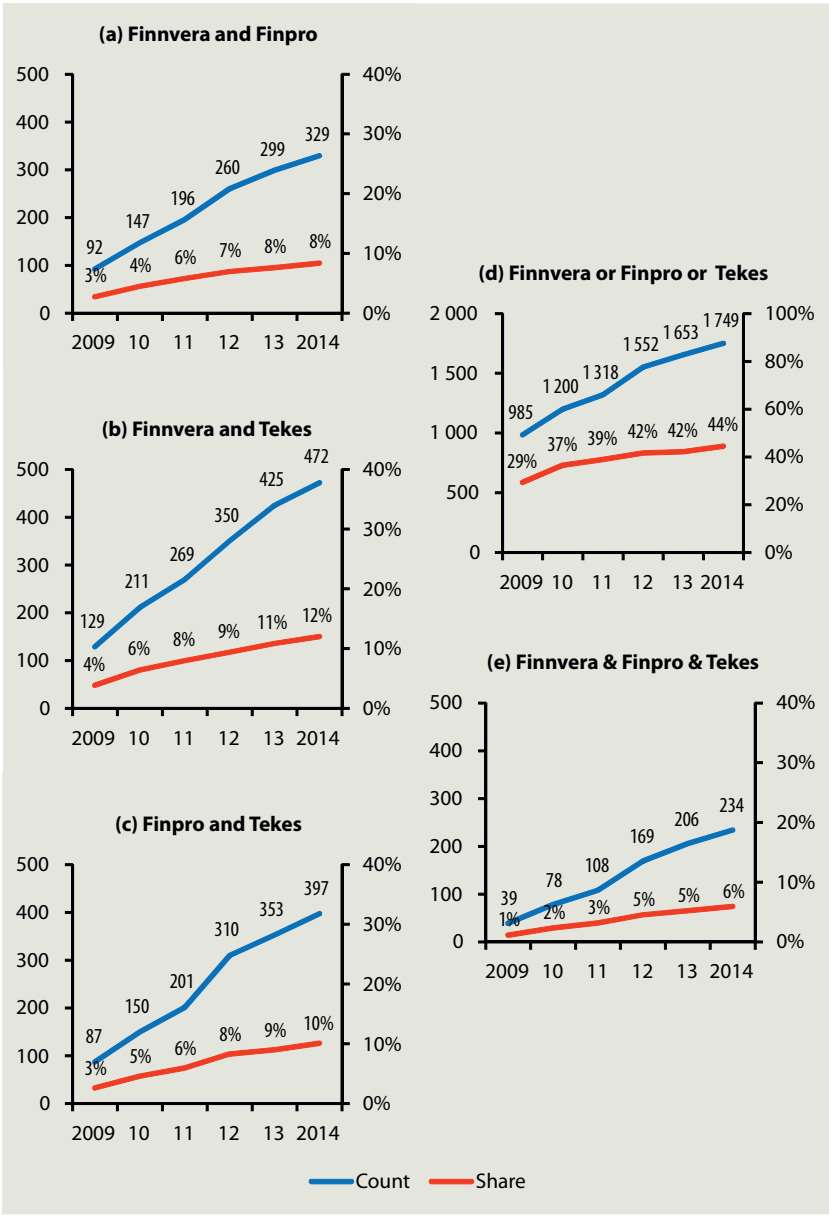



**FIGURE 5.** The number of supported firms and their share of the target population in the cases of multiple support organizations between t–1 and t+1. Data source: Statistics Finland.



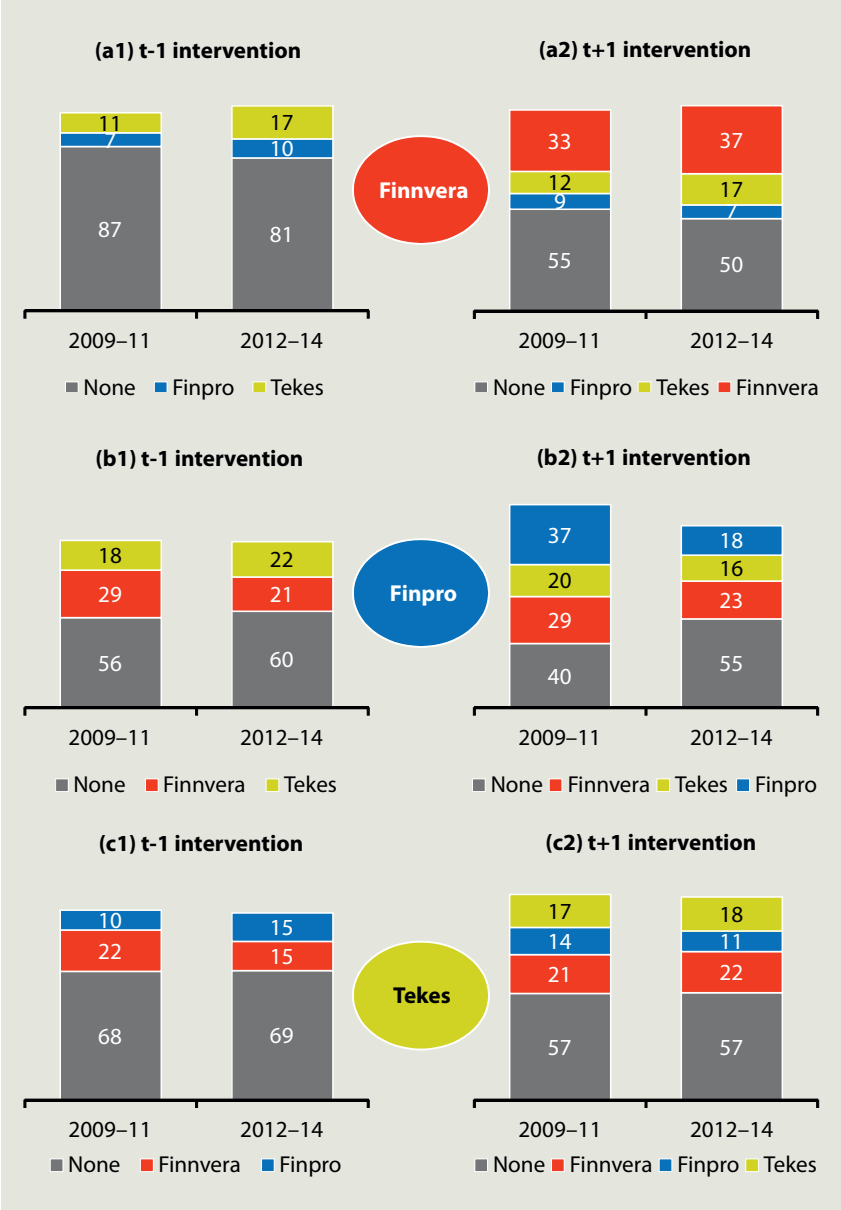



**FIGURE 6.** The percentage distributions of t–1 and t+1 support statuses of firms that received initial support at t by the organization marked by the oval.
Data source: Statistics Finland. The percentages depict the averages over the periods 2009–11 and 2012–14. The stacked columns in the charts do not equal 100 because a firm may be concurrently supported by one or more organizations.

In Figure 6, we have further explored the interaction of the organizations in supporting activities and especially their mutual ex-ante and ex-post linkages. In the figure, we focus on the firms that have received initial support from the organization illustrated by the oval at time t. We have calculated the share of these firms that have received support from the other organizations one year before (t–1). The same calculation has been conducted one year after the support year (t+1). In addition, we have separated the calculations into two periods: 2009–2011 and 2012–2014. This has been done in order to address whether there have been substantial changes in mutual linkages over time.

In the case of firms that were initially supported by Finnvera, we can see that prior to the first support year, the majority of the firms (81–87%) had not been supported by either Finpro or Tekes. From those that have been "clients" of the either organization, it has been more common that they have been dealing with Tekes. Furthermore, in the latter period, the shares of ex-ante support by the other two organizations have increased. For example, 11% of the firms initially supported by Finnvera in 2009–2011 were granted support from Tekes at

t–1. In 2012–2014, the share increased to 17%. Moreover, it seems that Finnvera is not notably "feeding" the other two organizations by its newly supported firms. This is assessed by comparing the shares of ex-ante and ex-post shares of firms that have been supported by the organizations. For instance, 11% of Finnvera's new "clients" were supported at t–1 by Tekes in 2009-2011. At t+1, the share was 12% during the same period. About half of the firms that received initial support do not continue using Finnvera's or the other two organizations' services in the following year. About one-third continue using Finnvera's services.

When examining the firms that were initial clients of Finpro, we can observe that they were ex-ante more likely supported by the other two organizations than in the case of Finnvera. Nevertheless, also in the case of Finpro, 56–60% of the firms have not been supported by the other organizations at t–1. However, the development is mixed among the organizations. The share of firms supported earlier by Tekes increased from 18% in 2009–2011 to 22% in 2012–2014, and the share of firms supported earlier by Finnvera decreased from 29% to 21%, respectively. Like in the case of Finnvera, Finpro seems to not "feed" its new clients to the other two organizations, as indicated by comparing the before-after percentages of the firms supported by the organizations. For example, the proportion of firms supported by Tekes was 18% at t–1 and 20% at t+1 in 2009–2011. Furthermore, the percentage of firms that continue to use Finpro's services at t+1 dropped quite dramatically from 37% in 2009–2011 to 18% in 2012–2014. This may be at least partly due to the restructuring of Finpro's activities.

Finally, looking at the internationally oriented SMEs that were granted initial support by Tekes, we can note that almost one-third of the firms were supported at t-1 by either of the two other organizations. The share of firms supported earlier by Finnvera decreased from 22% in 2009–2011 to 15% in 2012–2014, and the share supported earlier by Finpro increased from 10% to 15, respectively. It seems that in the latter period, there has been "feeding" of the newly supported firms to Finnvera. This is indicated by the fact that 15% were supported at t–1 by Finnvera and 22% at t+1 in the observation period of 2012–2014. Instead, in the earlier observation period, the ex-ante and ex-post shares are close to each other at slightly above 20%. In the case of Finpro, the results regarding the "feeding" effects are mixed. In the period of 2009–2011, we can notice some indication of this hinted by the observation that at t–1 and t+1, 10% and 14% of firms newly supported by Tekes, respectively, had been clients of Finpro. However, in the latter period, there seems to not be "feeding" of firms newly supported by Tekes to Finpro. This is indicted by the observation that from the firms newly supported by Tekes, 15% were using Finpro's services at t–1 and 11% at t+1. Almost one-fifth of the internationally oriented SMEs granted initial support by Tekes were also granted support in the following year. This proportion is lower than in the case of Finnvera. This may be partly due to

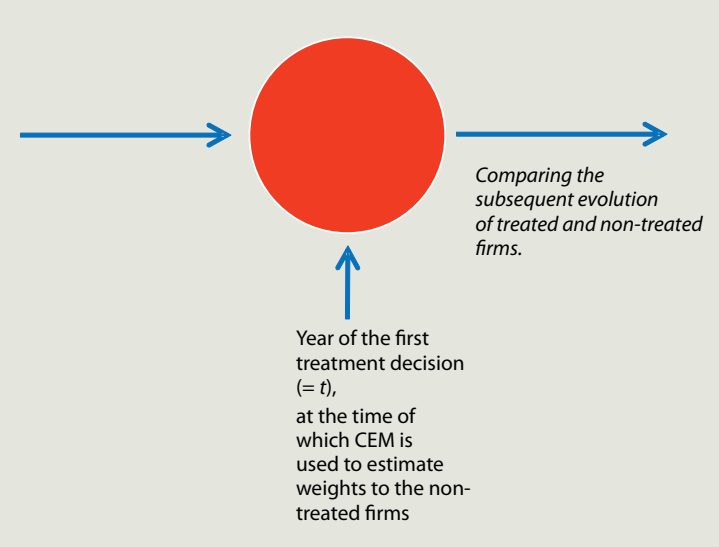
the differences in the administrative processes of the supporting instruments. Furthermore, the focuses of the supporting activities are different. Tekes primarily supports research and development projects. Finnvera supports the more general expansion of firms' business activities, and it also has socio-political aims, such as supporting regional and sexual equality.

## TREATMENT

In this section, we focus on the development of the internationally oriented SMEs supported by Finnvera, Finpro or Tekes. Because the support is not usually randomly distributed and we never observe the treated firm's outcome without treatment, we form a statistical model to find an answer to a counterfactual question: what would have happened to the treated firms without treatment? In addition, we also need the statistical model because due to the selection bias of the treated firms, it is possible that the treated firms would perform well, even without the support.

Figure 7 depicts the basic structure of the statistical model we are using in the analysis. First, for each treated firm group ("Finpro", "Finnvera", "Tekes") and the vintage (i.e., the year when a firm gets support), we have performed matching analysis with respect to our firm population using the "Coarsened Exact Matching" (CEM) method developed by Iacus, King & Porro (2011,

**FIGURE 7.** Description of the basic structure of the treatment analysis. Source: Authors' sketch.




2012). In this procedure, the data have been temporarily coarsened, and exact matching is conducted with these coarsened data. As the authors argue, the CEM method reduces the degree of model dependence and causal effect estimation error by ex-ante user choice. It has monotonic imbalance bounding so that reducing the maximum imbalance on one variable has no effect on others. It does not require a separate procedure to restrict data to common support, is approximately invariant to measurement error, and balances nonlinearities and interactions in the data. The explanatory variables in the analysis were firm age, size, industry and

the share of firm's workers in innovation related tasks. From this analysis, we obtain the weights to make the non-treated and treated firms similar with respect to the abovementioned observable characteristics. In other words, non-treated firms are weighted such that they represent the counterfactual outcomes that the treated firms would have had without receiving treatment.

The weights are utilized in the second stage, in which we use a difference-in-differences analysis on the outcome variables. The outcome variables are employment in Finland, employment abroad, turnover in Finland, turnover abroad, exports from Finland and labor productivity in Finland. Nominal financial amounts have been deflated using the GDP deflator (2015=100) to take into account the changes in the prices. During the procedure, we first calculated the differences in the outcome variable with respect to the treatment year for each firm to form a dependent variable. After that, we performed a weighted ordinary least square estimation in which the explanatory variables are the treatment-indicator and the indicator variables control for the vintage (i.e., time dummies). We exclude the treated firms that received the support at t-2 or t-1 and the control firms that received the support at t-2 – t+2. This is done because we want to analyze the influence of the treatment on those firms that received "fresh" support and compare the effects to those that did not receive support near the treatment year. In total, the analysis has six vintages of firms to study the effects at one year after the treatment and one vintage to study the effects at six years after the treatment. It should be noted that the same firm can be in several vintages if it fulfills the above described criteria.

Figures 8–10 summarize the results. The charts include the mean estimates of the differences of the treated vs. non-treated firms with respect to each outcome variable and the lower and upper bounds of the 90% confidence intervals. The information in the charts can be interpreted so that if the estimated difference is positive, it is statistically significant at the 10% error level if the curve depicting the lower bound of the 90% confidence interval is above the x-axis, and vice versa.

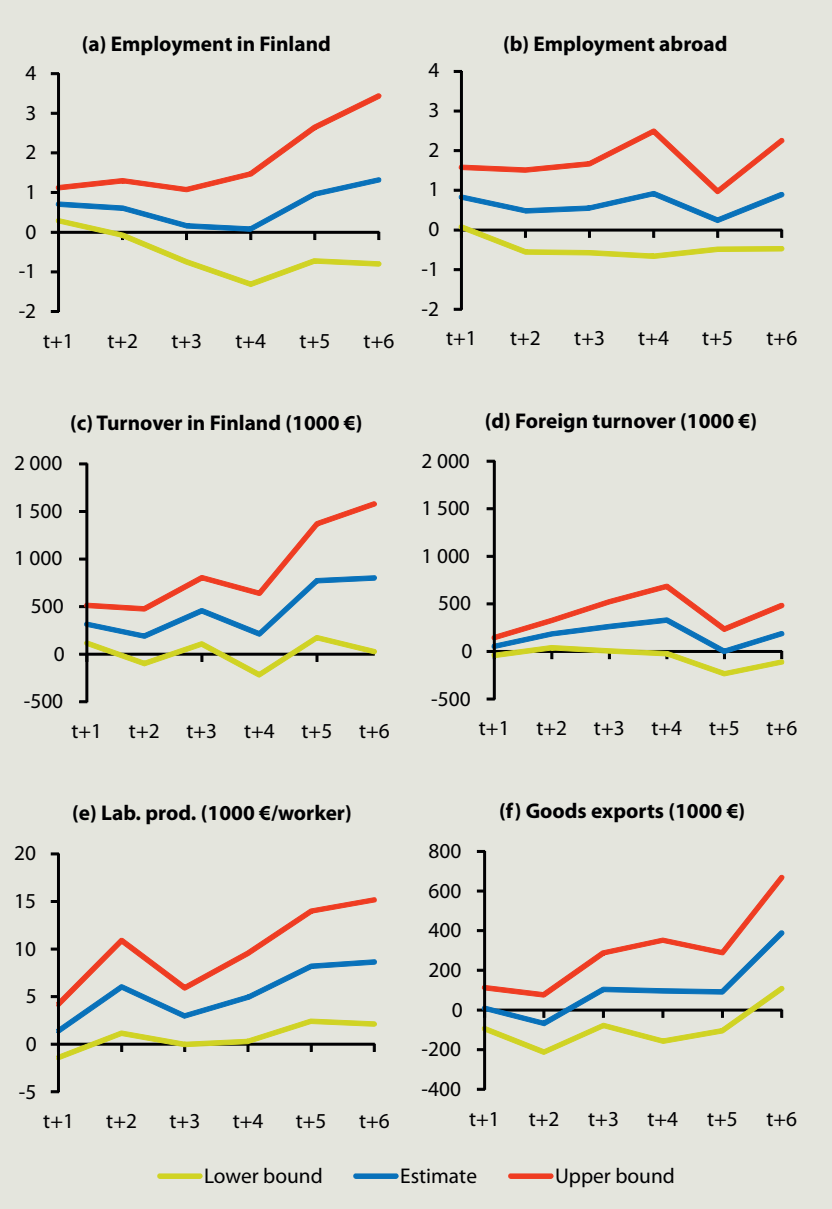



**FIGURE 8.** The differences in outcomes after the treatment year in the treated firms vs. the non-treated firms (mean estimates and lower and upper bounds of the 90% confidence intervals) in the case of Finnvera.
Data source: Statistics Finland. The nominal amounts have been deflated by the GDP deflator (2015= 100).

Figure 8 illustrates the findings related to Finnvera. We can see that the support had a short (one year) statistically significant positive effect on both employment in Finland and employment abroad. Additionally, in other years, the mean estimate of the differences is positive with respect to both outcome variables, but there is so much dispersion that the results are not statistically significant. In the case of turnover in Finland, the treated firms perform better than the non-treated firms in all other years but t+2 and t+4. With respect to foreign turnover, the differences are positive and statistically significant at t+2 and t+3. Furthermore, the results hint that the firms supported by Finnvera perform better than non-treated firms with respect to labor productivity, particularly from t+4 onwards. Finally, the treated firms do not seem to more intensively increase their goods exports than the non-treated firms, on average. Only at t+6, which includes only one vintage (year 2009), is the difference positive and statistically significant at the 10% level.

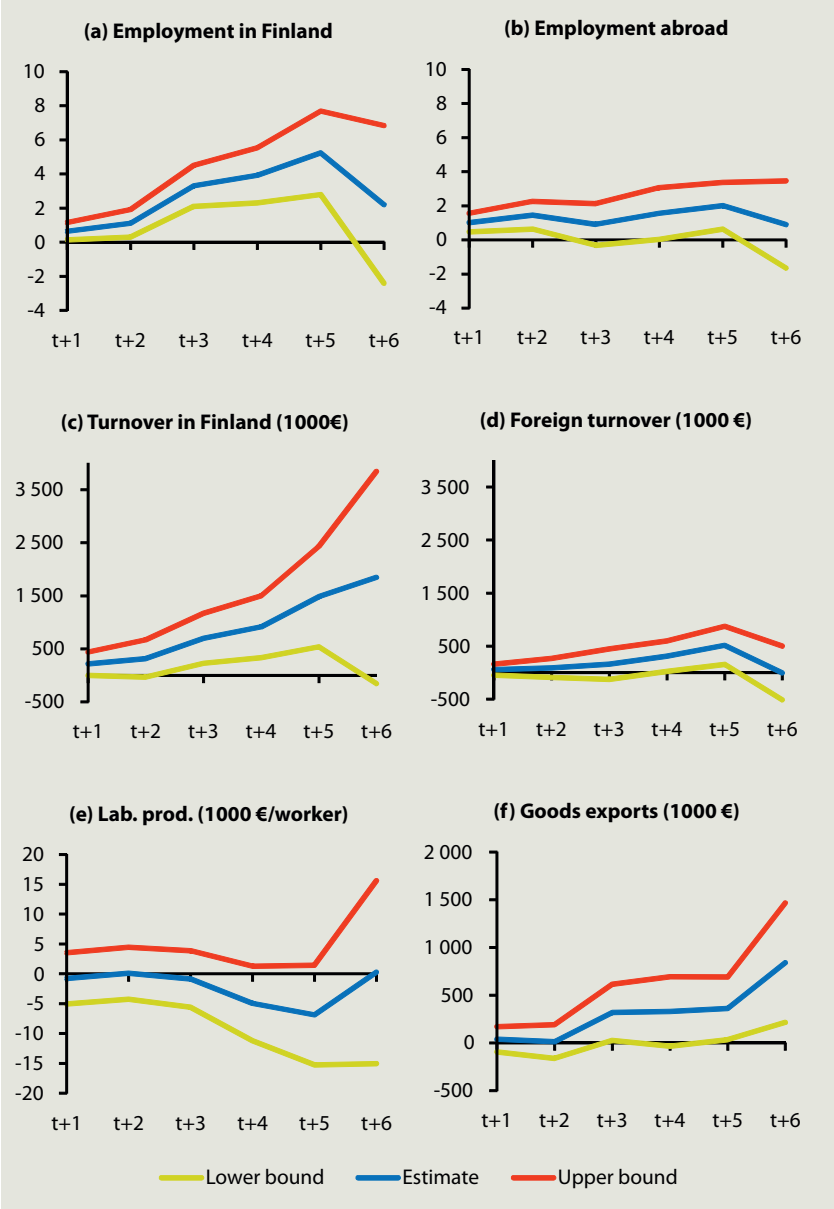



**FIGURE 9.** The differences in outcomes after the treatment year in the treated firms vs. the non-treated firms (mean estimates and lower and upper bounds of the 90% confidence intervals) in the case of Finpro.
Data source: Statistics Finland. The nominal amounts have been deflated by the GDP deflator (2015= 100).

Figure 9 depicts the results in the case of Finpro. We can observe that the firms treated by Finpro perform well in terms of the growth of both employment and turnover. The employment in Finland has statistically significantly increased in the firms treated by Finpro more than in the non-treated firms in all time periods except t+6. Moreover, the employment effects abroad are also positive with the exceptions of t+3 and t+6. The differences in turnover in Finland are positive and statistically significant in all periods except t+2 and t+6. The differences in foreign turnover are positive and statistically significant at t+4 and t+5. In terms of the development of labor productivity, we find no statistically significant differences between the treated and non-treated internationally oriented SMEs. Finally, the differences in the development of exports are positive and statistically significant at t+3, t+5 and t+6.

Figure 10 shows that the employment in Finland has increased more in the firms treated by Tekes than in the non-treated firms. Moreover, we can observe that the differences increase over time. For instance, three years after the treatment, the treated firms employ 1.3 more

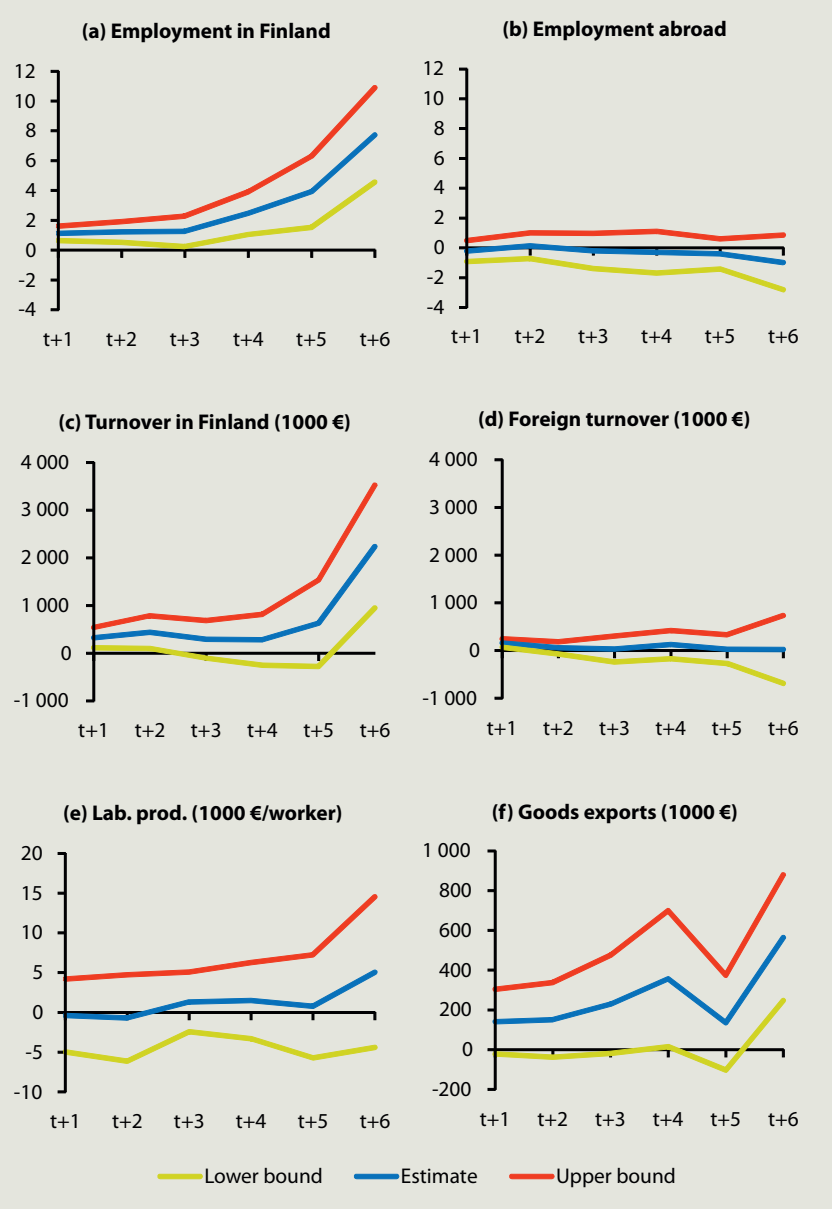



**FIGURE 10.** The differences in outcomes after the treatment year in the treated firms vs. the non-treated firms (mean estimates and lower and upper bounds of the 90% confidence intervals) in the case of Tekes.
Data source: Statistics Finland. The nominal amounts have been deflated by the GDP deflator (2015= 100).

full-time equivalent workers than the non-treated firms, and six years after the treatment, they employ 7.7 more full-time equivalent workers than the non-treated firms, on average. In terms of employment abroad, we find no statistically significant differences. In the case of the development of turnover in Finland, there seem to be positive effects in the short term at t+1 and t+2 and in the longer term at t+6, although the latter observation should be treated with some caution because it is based on the sample of only one vintage (year 2009). With respect to foreign turnover, there is a positive and statistically significant difference at t+1, and we find no statistically significant differences in other time periods. In addition, the results hint that the internationally oriented SMEs treated by Tekes do not perform better than the non-treated firms in terms of labor productivity. With respect to goods exports, the results are not robust, and the differences are positive and statistically significant only at t+4 and t+6.

# FINDINGS OF THE QUANTITATIVE ANALYSIS

In this section, we have focused on the Finnish internationally oriented SMEs and particularly on the supporting activities of the Team Finland organizations (Finnvera, Finpro and Tekes) with respect to these firms during the period from 2009–2015. There are in total nearly 4000 internationally oriented SMEs in Finland. They account for approximately 9–10% of the business sector employment. We find that almost half of these firms were supported by at least one of the organizations of Team Finland. Finnvera has been the most active in this respect, reaching more than a tenth of the firms each year. Furthermore, it has granted the largest support amounts per firm, on average. However, due to differences in the support instruments and their targets, the support amounts of the organizations are not fully comparable.

When analyzing the firms being initially supported by a particular Team Finland organization, we find that there has not been any large-scale "feeding" of these supported firms from one organization to another. Only in the case of Tekes do the results moderately hint that in recent years, it has been feeding its newly supported firms, particularly to Finnvera. In addition, in the case of all Team Finland organizations, the majority of the internationally oriented SMEs that were initially supported have been ones that were not supported earlier by any of the three organizations.

Compared to the non-treated internationally oriented SMEs, the firms treated by the organizations of Team Finland are younger, more export-intensive and are more likely to have workers in innovation related tasks, on average. Moreover, their level of labor productivity is lower, on average. This observation hints that the supported firms may be more likely than the target population's other firms in an investment phase. In other words, they are investing in human capital and other factors of production more heavily than their value added is growing. The treatment analysis indicated that with respect to the non-treated firms, only the firms treated by Finnvera statistically significantly improved their performance with respect to labor productivity during the years 2009–2015. However, the firms supported by Finpro or Tekes have performed well with respect to employment growth in Finland, and the clients of Finpro also improved in terms of sales growth. The treatment effects on the foreign operations of the firms have been quite negligible in the case of all Team Finland organizations.

# ROLE OF TEAM FINLAND IN INDUSTRIAL ECOSYSTEMS

The purpose of the following analysis is to examine the position of Finnish enterprises in global value chains and their potential for innovation-led export growth, and also illustrate how Team Finland actors and particularly Tekes, Finpro and Finvera have contributed to their development. The analysis utilizes an ecosystems approach by observing three export-oriented industrial ecosystems in Finland; Digital Health, Food, as well as Maritime & Offshore ecosystems.

Industrial ecosystems in this context are understood as adaptive systems enterprises whose behavior arises from the interplay of interconnected economic actors. Mature and functional ecosystems are similar to clusters, but the earlier cluster literature stressed colocation as a major factor, while ecosystems analysis does not force the assumption. Ecosystem analysis also pays more attention to the various phases of development, as will be seen below. (Salminen & Halme, 2017)

The following table summarizes the ecosystem analysis in terms of the factors of the framework. The general overview is positive and generally TF activities are aligned with global demands and are timely. Historically and presently particularly BF programs have a role in gathering different types of actors to collaboration, between the industry, between industry and research organizations, and to various Public-Private Partnerships (PPPs). Lately with the ecosystem focus, PPP-activities have been reinforced. Recently TF activities have also increasingly focused on fostering entrepreneurship. Especially in the context of ILEG, the finding that while TF has organized international expots promotion activites particularly in the Growth Programmes (see below), RDI funding activities predominately focus on creating domestic partnerships, begs the question could international collaboration and knowledge exchange be incentivized even more.

**TABLE 3.** Overview to the findings from the ecosystem analysis.

| FACTORS OF COMPETI-TIVENESS | DIGITAL HEALTH | | FOOD | | MARITIME & OFFSHORE | | SUMMARY OF TEAM FINLAND CONTRIBUTION |
|---|---|---|---|---|---|---|---|
| | Ecosystem characteristics | Team Finland contribution | Ecosystem char-acteristics | Team Finland contribution | Ecosystem characteristics | Team Finland contribution | |
| *External* | | | | | | | |
| **Trends in global demand** | The general trend is implementing existing IT technologies in health care environment. | TF has offered RDI and export program funding specifically for these themes. | The general trend is towards transparency in the food chain and origins. Natural and organic are hot affective buzzwords. | TF has offered RDI and export program funding specifically for these themes. | Shipping trends and consequent demand for shipbuilding are cyclical and depend on world economy and trade. The technological trends are towards increased integration of IT and efficiency of operation, and as the latest larger frontier, vessel autonomy. | TF has offered RDI and export program funding specifically for these themes. | TF in general and Business Finland programming has been timely and and aligned with general golobal trends. |
| **Foreign direct investment** | Centered around multinationals' corporate R&D in Finland. | TF has a role in funding applied research and development. | Little FDI, besides multinational holding companies owning some the large consumer brands in the Finnish market. | n/a | Major FDI in shipyards, engineering, and software enterprises. | TF has contributed to maritime and offshore, and helped anchor R&D and operations in Finland through RDI and exports programs and export loans and guarantees. | Invest-in activites are less visible, but TF and BF programs have contributed to anchoring and in some cases expanding multinationals' RDI activities and Finland. |

... TABLE 3.

| FACTORS OF COMPETITIVENESS | DIGITAL HEALTH | | FOOD | | MARITIME & OFFSHORE | | SUMMARY OF TEAM FINLAND CONTRIBUTION |
|---|---|---|---|---|---|---|---|
| | Ecosystem characteristics | Team Finland contribution | Ecosystem characteristics | Team Finland contribution | Ecosystem characteristics | Team Finland contribution | |
| **Structure and dynamics of global value chains** | Health care is characterized by large institutional buyers and large incumbent solutions providers.<br>Consumer segment is more varied with established and large enterprises and smaller and newer entrants, but competition is very heavy. | TF support could potentially play a significant role in advancing and securing Finnish company positions in emerging global value chains. | Value chains are typically relatively national and localized, except for ingredients and produce, and some categories.<br>The agri-business and food industry traditionally volume industries, where margins are low and economies of scale and maximizing the throughput of capital investments are key. | TF support has contributed to developing higher value products and gaining a foothold in international value chains. | Very capital intensive and dominated by large multinationals. Shipping industry and brokers have a major role as buyers, and traditionally shipyards act as a node in the value chain that collects the network of providers for a joint offering. In recent years modules and systems suppliers have however gained more traction in dealing directly with the end user and have gained more responsibility in the value chain. | TF support has contributed to developing higher value products and gaining a better position in international value chains. | TF programs have contributed to upgrading value creation and thus advancing positions in global value chains. |

... TABLE 3.

| FACTORS OF COMPETITIVENESS | DIGITAL HEALTH | | FOOD | | MARITIME & OFFSHORE | | SUMMARY OF TEAM FINLAND CONTRIBUTION |
|---|---|---|---|---|---|---|---|
| | Ecosystem characteristics | Team Finland contribution | Ecosystem characteristics | Team Finland contribution | Ecosystem characteristics | Team Finland contribution | |
| **Policy and regulatory environment** | Health care is burdened by bureaucracy, regulation and varying standards and certifications. | TF produces relevant target market information. | Food regulations are relatively similar within market areas and moderately bureaucratic, excepting countries/ areas that use them as trade barriers. | TF produces relevant target market information. | Maritime regulations are partially international (e.g. IMO SOLAS and other conventions), but on coastal waters safety regulations vary wildly between jurisdictions and intended use, for example around the North Sea crews and vessels may have six different sets of regulations within a day's sailing. | TF produces relevant target market information. | TF main contribution is producing specific market information. |
| **International mobility and knowledge flows** | Large incumbents are multinationals and mobility is high, new entrants are often international particularly in the consumer sector. | TF funding contributes to anchoring and building up existing R&D. | Consumer brands and businesses are localized, mobility through multinational holdings. | TF funding contributes to anchoring and building up existing R&D. | Maritime and Offshore is a very international sector and exports driven. Finnish enterprises operate in multiple locations across the world with various partners and vice versa. | TF funding contributes to anchoring and building up existing R&D. | TF has contributed to anchoring and building up existing RDI activities. TF instruments do not have specific incentives or funding for foreign partners, international residencies, or attracting talent. The export programs facilitate international exchange through trade shows. |

**... TABLE 3.**

| FACTORS OF COMPETITIVENESS | DIGITAL HEALTH | | FOOD | | MARITIME & OFFSHORE | | SUMMARY OF TEAM FINLAND CONTRIBUTION |
|---|---|---|---|---|---|---|---|
| | Ecosystem characteristics | Team Finland contribution | Ecosystem characteristics | Team Finland contribution | Ecosystem characteristics | Team Finland contribution | |
| *Internal* | | | | | | | |
| **Domestic demand and markets** | Domestic demand is variable and determined by public sector institutions, but potentially relatively large. The current tradition is that the buyers rather purchase one-off/ custom systems than existing platforms or off-the-shelf solutions. | TF funding contributes to building collaboration between the user institutions and technology providers. | Domestic market is relatively small, price conscious and prefers local brands heavily. | TF funding contributes to building higher value goods and branding for domestic and export market. | Domestic market is relatively small, except for cruise ships. | TF funding contributes to building higher value goods and branding for domestic and export market. | TF has contributed to building Public-Private Partnerships and collaboration between domestic partners. However public markets are tied by procurement regulations, and often also a constrictive interpretation of said regulation or low risk-taking ability of potential users. |
| **Company system and economic structure** | Dominated by large (multinationals) with specialized small solutions providers. | TF contributes to building networks and joint R&D and offering within the ecosystem. | Large incumbents have a strong position, typically distributors/ grocery chains act as a gatekeeper to consumer markets. Small entrants have a good position if they develop a niche, often as a craft, artisanal, or healthy option. | TF contributes to building networks and joint R&D and offering within the ecosystem. | Large incumbents have a strong position, Finland has highly developed shipbuilding industry, and some of the world leading systems and module suppliers for propulsion systems, load handling and cabin modules. | TF contributes to building networks and joint R&D and offering within the ecosystem. | Large incumbent dominate the ecosystems, TF has contributed to forging new partnerships between incumbents and smaller newer entrants, as well as cross-industrial partnerships. |

**... TABLE 3.**

| FACTORS OF COMPETI-TIVENESS | DIGITAL HEALTH | | FOOD | | MARITIME & OFFSHORE | | SUMMARY OF TEAM FINLAND CONTRIBUTION |
|---|---|---|---|---|---|---|---|
| | Ecosystem characteristics | Team Finland contribution | Ecosystem char-acteristics | Team Finland contribution | Ecosystem characteristics | Team Finland contribution | |
| **Financial system** | Limited access to venture capital in general, access to int'l VC very competitive and limited, R&D subsidies and loans, export loans and guarantees available. | TF funding directly contributes to R&D and exports. | Limited access to venture capital in general, access to int'l VC very competitive and limited, R&D subsidies and loans, export loans and guarantees available. | TF funding directly contributes to R&D and exports. | VC not very relevant, R&D subsidies and loans, export loans and guarantees available. | TF funding directly contributes to R&D and exports. | TF funding contributes dir%ectly to RDI and is seen as vital to sustaining RDI intensity necessary to compete gobally.<br>Export loans and guanrantees are equally vital for export of capital goods.<br>Venture capital availability is orders of magnitude smaller than some other markets. |
| **Regulation** | Regulation for medical devices is extensive, for general management systems no specific regulation. | n/a | Food regulation is largely driven by EU | n/a | Maritime regulation is largely international. | n/a | Regulation for these sectors is largely internationally driven and in some cases fragmented. The regulation itself is outside the control of TF, however TF contributes by producing relevant information. |

**... TABLE 3.**

| FACTORS OF COMPETITIVENESS | DIGITAL HEALTH | | FOOD | | MARITIME & OFFSHORE | | SUMMARY OF TEAM FINLAND CONTRIBUTION |
|---|---|---|---|---|---|---|---|
| | Ecosystem characteristics | Team Finland contribution | Ecosystem characteristics | Team Finland contribution | Ecosystem characteristics | Team Finland contribution | |
| **Education and research system** | Large talent pool of IT-related workers and accumulated expertise. Collegiate and graduate education for IT is very broadly offered and related research is well-funded. Additionally Finland has specific strengths in biomedical research. | TF has had a role over a longer period of time in supporting applied research and development in IT, now including Digital Health specifically. | Food industry related education is offered at collegiate and graduate levels food biotechnology, food chemistry and food economics in selected colleges and universities, and Natural Resource Institute works with the food chain actors. Secondary education is focused on hospitality industry and primary or secondary processing. | TF RDI and export programs directly contribute to gathering industry and research institutions together for collaboration. | Finland has a strong tradition in engineering education, of late especially in IT. However other relevant disciplines such as mechanical engineering has been on decline. | TF RDI and export programs directly contribute to gathering industry and research institutions together for collaboration. | TF has a direct contribution in supporting collaboration in PPPs and applied research that contributed to RDI. |
| **Intermediaries and knowledge transfer** | There are three digital health accelerators, including the first one in the Nordics. Long tradition of collaborative research between academia and industry. | TF and specifically Tekes has had IT focused RDI programs close to two decades in some form, Bits of Health is the most recent ongoing one directed specifically for digital health. RDI and export programs directly contribute to gathering industry and research institutions together for collaboration. | At least one accelerator operates with the incumbents in the food industry. The RDI programs and export program act as a platform for knowledge exchange. | TF RDI and export programs directly contribute to gathering industry and research organizations together for collaboration. | Traditions in collaborative research in various RDI programs has been the main venue, to the extent that advanced R&D is to some extent dependent on collaborative research with universities and research institutes. | TF RDI and export programs directly contribute to gathering industry and research institutions together for collaboration. | TF programs have an intermediary function in building PPPs and collaborations and partnership within industry and with research organizations. |

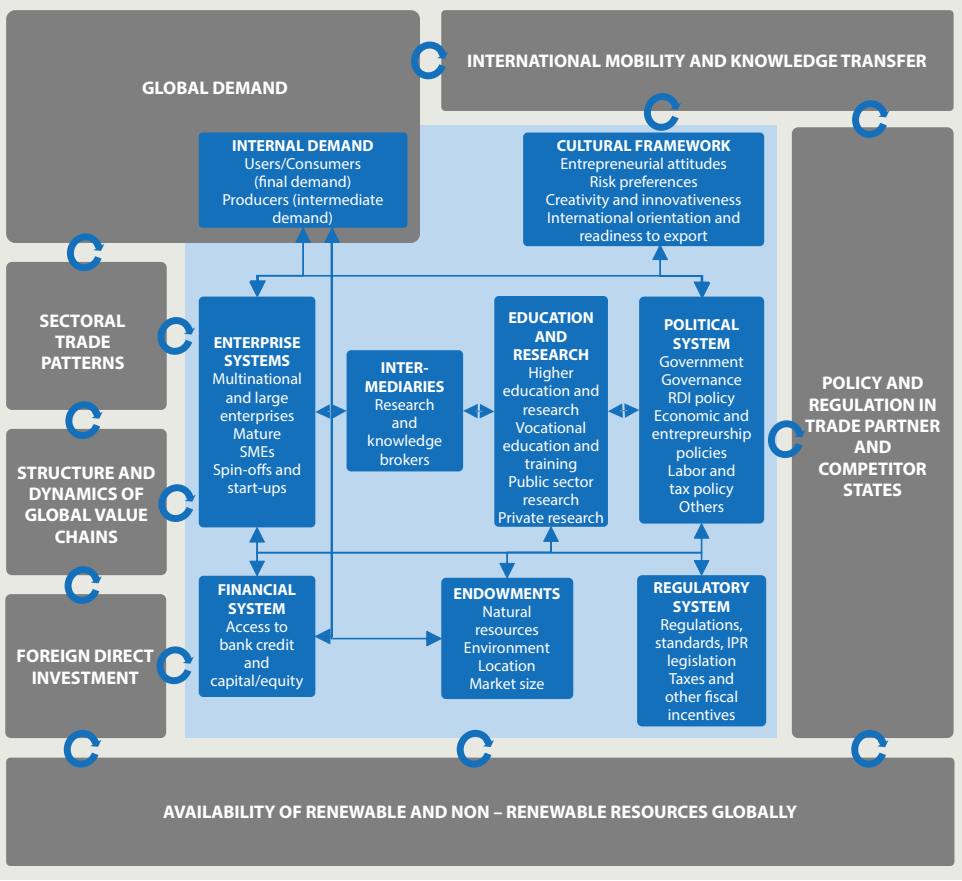
... TABLE 3.

| FACTORS OF COMPETITIVENESS | DIGITAL HEALTH | | FOOD | | MARITIME & OFFSHORE | | SUMMARY OF TEAM FINLAND CONTRIBUTION |
|---|---|---|---|---|---|---|---|
| | Ecosystem characteristics | Team Finland contribution | Ecosystem characteristics | Team Finland contribution | Ecosystem characteristics | Team Finland contribution | |
| **RDI policy / innovation** | There are specific strategies in place for among other things Digital and e-Health, including Health Sector Growth Strategy for Research and Innovation Activities (2014), a related roadmap (2016) and eHealth and eSocial Strategy 2020 (2015) | TF supports digital health and ecosystem formation directly and implements the MEAE Growth Strategy. | The latest joint PPP strategy for the food industry is from Sitra's past food industry program 'ERA' (2006), Ministry of Agriculture has published more recently a strategy for potato products (2011), and a report on Food Policy 'Food2030' (2016) . Technical Research Center of Finland has published a 'Food Industry 4.0' vision on their own behalf (2017) | TF RDI program Sapuska was a sequel for the Sitra ERA program, and the present Fiilis RDI and Food from Finland exports programs are the follow-up. TF has contributed to development of new food products and processes that have since been launched to international markets in exports program. | Maritime & offshore is featured in Finland's Arctic Strategy 2013 as one of the key focus areas. Maritime industry has published an R&D strategy 'Maritime cluster strategic research agenda 2017-2025', and a new autonomous vessel R&D program ecosystem has recently started as a PPP. | TF has had targeted RDI programs for maritime and offshore, latest one focused on arctic conditions, and an export program. Maritime & offshore is also a large client segment for Finnvera loans and guarantees.<br>The earlier TF-funded SHOK activities have continued through the period. | The examined ecosystems are covered by sectoral strategies and specific TF programs. Generally Finnish RDI policy has been strong, despite the recent cutbacks. |
| **Cultural (entrepreneurial) framework** | Traditionally medical devices have been a large incumbents segment, with often long development times and large up-front investments. The general start-up culture has spurned new specialized consumer oriented software companies that aim for well-being and preventative care markets and self-monitoring. | TF actions support starting up and developing new innovations. | Traditionally bulk of the market is dominated by large incumbents. Smaller enterprises are commonly specialized and/or artisanal 'craft' producers. The recent trends have enabled creation of more brand and quality focused smaller enterprises. | TF actions support starting up and developing new high-value products, offerings, and upgrading value chain positions. | Dominated by large incumbents. Maritime and offshore is a capital intensive industry with long lead times. Smaller enterprises are commonly specialized suppliers. | TF actions support starting up and developing new high-value products, offerings, and upgrading value chain positions. | The general challenges in Finland have been lack of international orientation and entrepreneurial risk taking. TF programs have recently paid attention to start-ups and have ctonributed to upgrading value propositions and business models towards better positions in global value chains. |

## FRAMEWORK FOR ANALYSIS

The following figure (Figure 11) presents an overall framework for analysis, used previously for assessing global competitiveness of Finnish industry (Reid *et al.*, 2016). The outer rim in grey color illustrates the framework or global markets that act as a framework for any exports activities that are typically only partially controllable by any one state. In this study the framework is used to structure the analysis in a cross-sectional manner, assessing the factors for the ecosystems based on documents and interviews, and highlighting the contribution of Team Finland, particularly the former Tekes and Finpro as well as Finnvera.

**FIGURE 11.** Framework for assessing systemic impacts in relation to innovation-led export growth (Reid *et al.* 2016).




The previous study (Ibid.) conducted in 2016 looked at the competitiveness of national economy and concluded that in general the Finnish strengths are a highly educated workforce, good governance, and strong RDI/innovation policy, which all support innovation. The identified weaknesses were small internal markets, dependence on relatively few exporting sectors, and relatively inflexible governance and high taxation. In addition, the study was concerned about entrepreneurial and international orientation, access to finance and endowments. A recent decomposition of the World Economic Forum indicators also highlights some of the same points in finding that while Finland has a high overall competitiveness rating, specifically indicators related to innovation have been on decline in recent years (Pajarinen, Rouvinen and Ylhäinen, 2017). While these are general factors outside the control of Team Finland actors, they are nevertheless relevant as context for understanding the development of the ecosystems.

## CASE SELECTION AND CONTEXT

The analysis focuses on three existing or emerging ecosystems: Health, particularly Digital Health, Food, and Maritime & Offshore. The selection was based on the one hand on the importance to Finnish economy in terms of contribution to employment, value added and also potential growth. On the other hand, the cases are aimed to to bring fresh perspectives to RDI policy discussion.

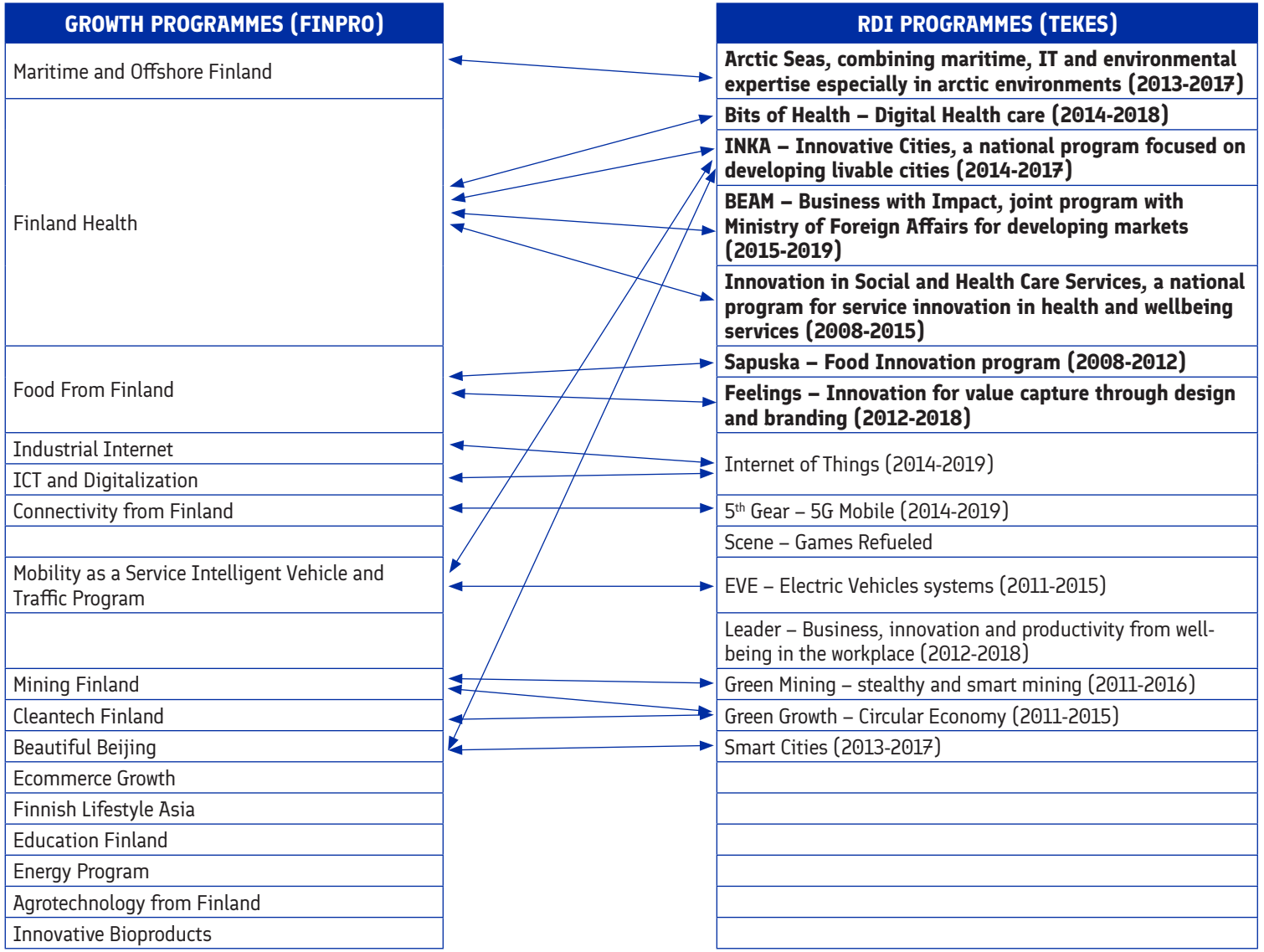
The following descriptions of ecosystems are based on a series of interviews among civil servants, representatives of industry associations and industrial anterprises, and secondary data, such as documents. The analysis focuses on the current development and changes in the ecosystem and Business Finland's current and future role in the developments. The methodology follows the case study approach where the level and unit is pecifically the ecosystem. The limitations are that the findings are immediately applicable to similar ecosystems. However, due to the triangulation between different industrial contexts, the cases together feed into analytic generalization on contribution of Team Finland to Innovation-led Export Growth.

Within Team Finland, historically there has been a division of work between Finnish Innovation Funding Centre – Tekes, in charge of RDI funding, and export agency Finpro/Export Finland in charge of exports promotion. The agencies merged into Business Finland at the start of 2018. The following table represents Tekes and Finpro activities at the end of 2017, the end of the study period. The former Finpro/Export Finland lists 18 different Growth Programme exports programs, among them Finland Health, Maritime and Offshore Finland, Food from Finland which are the most relevant for the following ecosystems. They have their corresponding RDI programs, as illustrated by the following figure. In this study we will not review the content of each program, but highlight the aspects that have contributed to the ecosystems as highlighted by the data.

The content of the programs varies somewhat, but the general elements are consistent. For the RDI programs the main activity has been RDI funding in the form of grants and loans and related advisory, and other, supporting, activities include different networking activities, workshops, roadshows and similar events. For the last period Tekes general principle has been that funding is directed for projects, which are evaluated based on how well they contribute to growth and innovation. For the exports programs, the general elements include again networking and information events, coaching and advisory services, as well as other direct activities for opening new markets, including trade missions, buyers' events and jointly organized trade fair visits.

Under Business Finland, these program themes have been consolidated into eight networking programs, including Arctic, Bioeconomy and Cleantech, Digitalization, Developing Markets, Creative Industries and New Value Creation, Tourism, Health and Wellbeing, and European Programmes which refers to EU-funded programs. This consolidation is happening after the study period and data collection have ended, and as such the findings do not reflect the new program structures under Business Finland.

**FIGURE 12.** Links between Team Finland exports and RDI programs (Adapted from Salminen *et al.*, 2016).



# DIGITAL HEALTH ECOSYSTEM

## OVERVIEW AND CURRENT DEVELOPMENT TRENDS

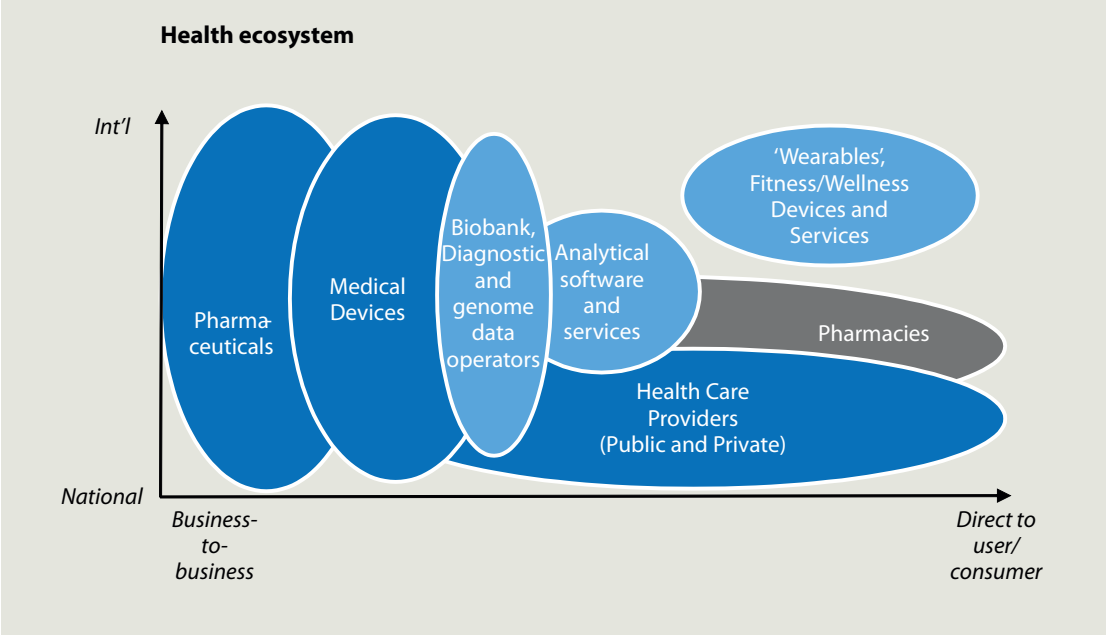
Medical devices and pharmaceuticals are the traditional backbone of health care innovation, that serve the medical and health care service providers. Digital Health itself is an emerging industry in the intersection of medical devices, diagnostics, pharmaceuticals, health care services, and information technology, and it is difficult to estimate the size based on these industries alone, but to provide scale: medical devices and pharmaceuticals in Finland comprise 419 enterprises with a combined turnover of approx. € 2.3 billions, and employment of more than 6500 people (According to Suomen Asiakastieto). The Finnish health care system is under a comprehensive and fundamental reform under the time of writing, and is anticipated to transform from a predominately public health care system towards a mixed model where public health insurance will increasingly cover also the use of private health care services under some form of the 'Freedom of Choice' legislation under preparation during the time of the writing. One foreseeable effect of the reform is that it has the potential to broaden innovation activities, as new entrants are entering the market and incumbents are developing new services and business models. However, these developments are likely to be more oriented towards the domestic market.

Digital Health in general is an emerging business area in the intersection of health care, biotechnology, medical devices, and IT. On the one hand it is driven by agglomeration of existing and new diagnostic data and digitized biological samples into biobanks and various other data pools to serve research and evidence based health care planning and management. On the other hand, Digital Health is driven by users' growing interests in personal health and wellbeing and fitness and use of various wearable recording devices and apps to monitor relevant data. The emerging themes in Digital Health are globally bringing existing hot IT technologies to health care, including machine learning, AI and (big) data analytics as well as mobile and wearable electronics, 'wearables' (*Digital Health 2018*, 2018). The largest investments are predicted to focus on developing precision insight for optimizing delivery of health care, more specifically developing solutions and platforms for managing data and analytics to provide up to date information for health care management and clinicians (Suennen, 2018). The associated development, that relates to Finnish health care reform, is evidence--based management that relies on comprehensive records of accumulated patient information to plan and design services and medical interventions that most effectively serve public health. Currently the major efforts are focused on development of biobanks and data integration, 'data pools,' within health care districts. These projects are in most cases funded by the health care operators.

## DEVELOPMENT OF THE ECOSYSTEM

The following ecosystem schematic descriptions, as exemplified by the first one below, follow the logic where in the x-axis represents the value chain position and distance from the customer interface and the y-axis focus between national and international markets. In this particular context consumers include patients, whose expense might be covered by the public health insurance. The logic is that generically value capture potential is larger when dealing with the customer or user more directly and when the market is larger. In other words, value capture potential grows when moving from bottom left towards top right.

**FIGURE 13.** Value chain position of the digital health ecosystem.




Under the theme of Digital Health, Finnish actors are active in three segments: One large area of activity is development of patient and diagnostic information systems and platforms that is partially driven by the health care reform. These information systems and data pools are developed to serve health care management in the changing health care system. This development also includes development of so-called biobanks, which serve medical sample and diagnostic data for research purposes. In this segment Finnish actors are developing IT systems and related software and services for managing and analyzing the data to offer insight into health care management. One such major example is the Clever Health Network program that brings together the Capital Area Hospital District and major IT solutions providers (Tammi, 2017) supported by Tekes.

Another segment is medical monitoring devices for clinical use, where the future direction is to broaden the scope of monitoring from traditional hospital bed monitoring more seamlessly towards home care and rehabilitation. In this segment Finnish actors of various size are developing both hardware and components, and software. Lastly, the related segment is the development of consumer grade 'wearables' and associates software or services, including mobile apps, for personal monitoring of health and well-being predominately in what might be called the pre-clinical phase, outside specific trauma or medical conditions. Between these two seg-

ments, due to the extensive regulation and demands of clinical care the medical device market is largely been covered by large enterprises who are able to also offer more comprehensive solution packages for institutional buyers, while the latter well-being and personal health segment has also vibrant start-up activity. However, the latter segment is also very competitive, with a multitude of existing parallel and overlapping services and solutions.

One of the main challenges of the market for digital health is related to this last finding. Globally regulatory frameworks in health care are variable and markets are somewhat fragmented, as each country has their own institutional arrangements and regulations. Often the buyers in business-to-business are large institutional buyers. SMEs are challenged to enter these markets alone, and often the market entry happens with a larger partner as a part of joint offering or as a part of an ecosystem. There is also a trend, that large enterprises are building their own ecosystems by encouraging and supporting start-ups that offer complementary products and/or services.

## TEAM FINLAND CONTRIBUTION

Team Finland's role has been to support innovation and exports through the Bits of Health RDI program (Tekes) and Finland Health exports program (Finpro). Bits of Health focuses on supporting innovation specifically in the area of digital health and wellness and states the objective of the program to make Finland a digital health environment that creates internationally competitive and successful enterprises. Other recent healthcare related programs are relevant to digital health as well, but for example INKA and the innovation in social and health services are oriented more towards domestic markets and developing public services. The exports program Finland Health then is a platform for displaying the services and products, as well as developing exports activities jointly. The latest initiatives are funding the CleverHealth network and Clinical Entrepreneurs Finland. The CleverHealth network is a public-private partnership aimed to foster collaboration between public sector hospitals and technology providers and to develop and pilot innovations. Clinical Entrepreneurs Finland supports company stays for clinicians in selected innovative SMEs.

According to the stakeholders, Team Finland's contribution has been the strongest in building collaboration. Specifically, the export programs have spawned organic collaboration between the enterprises. However, the experiences of particularly SMEs have been that during the recent years, the focus of the export program has been in invest-in activity. SMEs and other stakeholders who would benefit more from exports-related activities have felt left out. On the RDI program side the experience has been similarly positive as well, however the two major programs including the mentioned CleverHealth are in a stage where specific outcomes are only emerging. The experience is that the funding is a major contribution to developing technological solutions and platforms for the health care

market. Exports credits are seen as an important enabler as well. Altogether the portfolio of instruments is viewed as adequate. For future development, the main messages from the stakeholders are that continuity in programming themes is welcome and important for enterprises to be able to sustain the investment phase in the development, but the timing of programs and instruments is a challenge. From the view of the whole industry and the ecosystem has certain development phases from inception and search of business models, to RDI, system formation, and exports, but enterprises develop in different timing.

The following table 4 condenses the findings around the previously introduced framework. Generally both RDI policy and Team Finland actions are well aligned with global demand and current trends. Team Finland and in fact the whole innovation system has consistently invested in IT capabilities for over 30 years and there is a sizeable pool of talent that is relevant for this specific ecosystem and business area. The challenge at the moment is to connect these capabilities to the medical and health care fields and existing value chains. There are domestic and foreign-owned multinationals that have a foothold in global value chains, but for new entrants entry for the health care sector is challenging.

**TABLE 4.** Summary analysis of the digital health ecosystem.

| FACTORS OF COMPETITIVENESS | ECOSYSTEM CHARACTERISTICS | TEAM FINLAND (TEKES, FINPRO, FINNVERA) ACTIVITIES/CONTRIBUTION |
|---|---|---|
| *External* | | |
| Trends in global demand | The general trend is implementing existing IT technologies in health care environment. | TF has offered RDI and export program funding specifically for these themes. |
| Foreign direct investment | Centered around multinationals' corporate R&D in Finland. | TF has a role in funding applied research and development. |
| Structure and dynamics of global value chains | Health care is characterized by large institutional buyers and large incumbent solutions providers.<br>Consumer segment is more varied with established and large enterprises and smaller and newer entrants, but competition is very heavy. | TF support could potentially play a significant role in advancing and securing Finnish company positions in emerging global value chains. |
| Policy and regulatory environment | Health care is burdened by bureaucracy, regulation and varying standards and certifications. | TF produces relevant target market information. |
| International mobility and knowledge flows | Large incumbents are multinationals and mobility is high, new entrants are often international particularly in the consumer sector. | TF funding contributes to anchoring and building up existing R&D. |

**... TABLE 4.**

| FACTORS OF COMPETITIVENESS | ECOSYSTEM CHARACTERISTICS | TEAM FINLAND (TEKES, FINPRO, FINNVERA) ACTIVITIES/CONTRIBUTION |
|---|---|---|
| *Internal* | | |
| Domestic demand and markets | Domestic demand is variable and determined by public sector institutions, but potentially relatively large. The current tradition is that the buyers rather purchase one-off/custom systems than existing platforms or off-the-shelf solutions. | TF funding contributes to building collaboration between the user institutions and technology providers. |
| Company system and economic structure | Dominated by large (multinationals) with specialized small solutions providers. | TF contributes to building networks and joint R&D and offering within the ecosystem. |
| Financial system | Limited access to venture capital in general, access to int'l VC very competitive and limited, R&D subsidies and loans, export loans and guarantees available. | TF funding directly contributes to R&D and exports. |
| Regulation | Regulation for medical devices is extensive, for general management systems no specific regulation. | n/a |
| Education and research system | Large talent pool of IT-related workers and accumulated expertise. Collegiate and graduate education for IT is very broadly offered and related research is well-funded. Additionally Finland has specific strengths in biomedical research. | TF has had a role over a longer period of time in supporting applied research and development in IT, now including Digital Health specifically. |
| Intermediaries and knowledge transfer | There are three digital health accelerators, including the first one in the Nordics. Long tradition of collaborative research between academia and industry. | TF and specifically Tekes has had IT focused RDI programs close to two decades in some form, Bits of Health is the most recent ongoing one directed specifically for digital health. Bits of Health for example organizes Health Tuesday networking event the first Tuesday of every month. RDI and export programs directly contribute to gathering industry and research institutions together for collaboration. |
| RDI policy / innovation | There are specific strategies in place for among other things Digital and e-Health, including Health Sector Growth Strategy for Research and Innovation Activities (2014), a related roadmap (2016) and eHealth and eSocial Strategy 2020 (2015) | TF supports digital health and ecosystem formation directly and implements the MEAE Growth Strategy. |
| Cultural (entrepreneurial) framework | Traditionally medical devices have been a large incumbents segment, with often long development times and large up-front investments. The general start-up culture has spurned new specialized consumer oriented software companies that aim for well-being and preventative care markets and self-monitoring. | TF actions support starting up and developing new innovations. |

# FOOD ECOSYSTEM

## OVERVIEW AND CURRENT DEVELOPMENT TRENDS

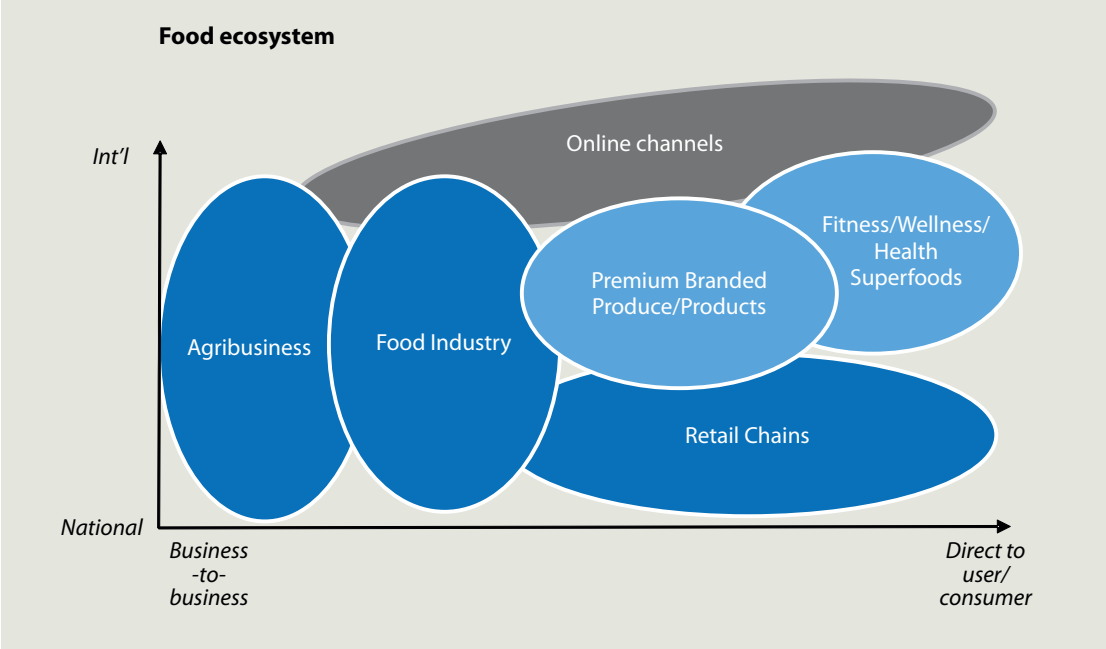
The food industry is the fourth largest industry in Finland with employment around 33 000 and approximately 2000 enterprises. Traditionally it has been dominated by primary and secondary sector activities, and large food industry enterprises that focus on dairy, meats, produce and convenience foods. To illustrate, out the largest enterprises one is a dairy, four trade or mill grains and three offer baked goods, four manufacture convenience foods in addition to slaughter and meat or vegetable packaging, one trades in spices and coffee, and two are in the drinks and brewery (Ruokatieto, 2017). While the large enterprises dominate the market, smaller typically local producers still have a hold, especially in the baked goods market. In terms of exports, the Finnish export portfolio is dominated by produce and ingredients, the top ones being dairy and sugar derivatives, pork, chocolate, oats and alcoholic beverages (Elintarviketeollisuusliitto Ry, 2017). Characteristically in global perspective food industry and its products are highly localized and accordingly also Finnish enterprises predominately deal on the domestic market. To illustrate, one of the interviewees said, 'ketchup is the only universal product that crosses borders with ease'.

The current global trends are centered on consumers' fears about food safety, and increased demands for transparency regarding the origins of foodstuffs, ingredients, and value chains. Relatedly there is increased fear over chemical-sounding ingredients and additives, and marketing claims increasingly center around 'natural', 'ethical', and 'environmental', which is seen as increased interest in and offering of plant-based products and organic foods. In parallel, different superfoods and enriched functional foods are in demand riding the wave of fitness and wellness trends. (Global Food Forums, 2017; Schug, 2017; Zegler, 2017) In the Finnish markets, these trends show as a brand of 'food nationalism' and domestic origin is heavily marketed. While the food industry is relatively concentrated, the interest towards specialty foodstuffs and even more localized farm-to-table value chains are offering new smaller enterprises a viable market. For exports, the main marketing efforts are built around presenting Finland as an environmentally sound and 'clean', arctic and exotic country.

## DEVELOPMENT OF THE ECOSYSTEM

The food ecosystem can be also divided in two segments. One is the incumbent food industry with large or medium-sized enterprises and the new entrants that are typically smaller and carry more specialized products. The common thread between them is that both aim to 'upgrade' or enter the premium segment with various added-value elements, by some combination of factors including organic or otherwise 'natural' in-

**FIGURE 14.** Value chain position of the food ecosystem.




gredients, artisanal production, explicit or implicit health claims, and building a halo of branding around the product.

For the incumbents this has meant negotiating trade deals in Asia and entering into distribution agreements with new online channels and developing new higher-value specialty ingredients. At the same time, however, the incumbents have also focused on developing added value and developing a more direct line to the consumer, evident particularly in the on-line distribution agreements.

Another recent development in exports have been led by SMEs who have a limited and specialized product line, a few examples being craft liquor and brewed drinks or Finnish berries and other 'superfoods'. These offerings are geared more readily for business-to-consumer, while the bulk of traditional export have been primary or secondary processes foodstuffs. Part of this effort is tightening relationship between large(-er) incumbents and start-ups or SMEs, where collaborations can be of mutual benefit especially both domestically and in exports. There are some examples where an incumbent enterprise has started building a base in the market and product development through acquisitions to build expertise and acquire brands and customer base.

## TEAM FINLAND CONTRIBUTION

Team Finland's main activities in this area have been 'Sapuska'-program (Eng. Chow-program) and Food from Finland export program. Sapuska was a continuation of a strategy project run by Sitra that brought the stakeholders of food and agri-business together to build a roadmap for innovation and value creation. Sapuska funded food process and related RDI projects. The present Feelings-program was originally marketed in transition for Sapuska participants. Feelings is not an industry specific, but a generic program focused on developing value capture form innovation e.g. by the way of branding and developing new business models. Food from Finland then organizes events, trade show visits, trade missions

and similar activities, with the straightforward aim to increase Finnish food exports by 2020.

In the food ecosystem, the contribution of Team Finland has been in building collaborations. Particularly the ongoing Food from Finland -program has been a venue for building collaboration 'organically' through joint activities, and also deliberately through organizing the Finnish participants towards joint offerings towards the export markets. There is some evidence of movement from the former Sapuska-program towards Food from Finland, as in technologies or products that were developed in Sapuska and now are marketed under Food from Finland. However, from the perspective of the food industry specifically, the previous RDI programs have been very technology focused and there has not been much focus on food industry in general, the programs are seen as one-off efforts. Continuity and focus on value capture are seen very important specifically for the food industry.

The following table 5 again condenses the findings. Food industry is typically a volume industry where economies of scale rule, and innovation cycle is relatively long. However, the Finnish industry is in renewal, partially because the earlier action, but change is also driven by the change in market landscape, as before the Ukrainian crisis 2014 and ensuing economic sanctions, Russia was one of the main food export markets. Afer the sanctions, the industry has been under pressure to search new markets and develop new value propositions. Team Finland for their part has and is contributing to the renewal, recently particularly through the exports program. This ecosystem concretely illustrated the chain from RDI to exports even in an industry traditionally considered 'low-tech' and the interviews clearly indicated that the earlier RDI funding contributed to development projects that would not have been otherwise done and the launching of the developed products to international markets through the exports programme. Particularly the emergence of new smaller 'crafty' enterprises is opportune for today's market and there is evidence of start-up – incumbent collaboration that can be an opportunity for mutual renewal.

**TABLE 5.** Summary analysis of the food ecosystem.

| FACTORS OF COMPETITIVENESS | ECOSYSTEM CHARACTERISTICS | TEAM FINLAND (TEKES, FINPRO, FINNVERA) ACTIVITIES/CONTRIBUTION |
|---|---|---|
| *External* | | |
| Trends in global demand | The general trend is towards transparency in the food chain and origins. Natural and organic are hot affective buzzwords. | TF has offered RDI and export program funding specifically for these themes. |
| Foreign direct investment | Little FDI, besides multinational holding companies owning some the large consumer brands in the Finnish market. | n/a |
| Structure and dynamics of global value chains | Value chains are typically relatively national and localized, except for ingredients and produce, and some categories.<br>The agri-business and food industry traditionally volume industries, where margins are low and economies of scale and maximizing the throughput of capital investments are key. | TF support has contributed to developing higher value products and gaining a foothold in international value chains. |
| Policy and regulatory environment | Food regulations are relatively similar within market areas and moderately bureaucratic, excepting countries/areas that use them as trade barriers. | TF produces relevant target market information. |
| International mobility and knowledge flows | Consumer brands and businesses are localized, mobility through multinational holdings. | TF funding contributes to anchoring and building up existing R&D. |
| *Internal* | | |
| Domestic demand and markets | Domestic market is relatively small, price conscious and prefers local brands heavily. | TF funding contributes to building higher value goods and branding for domestic and export market. |
| Company system and economic structure | Large incumbents have a strong position, typically distributors/ grocery chains act as a gatekeeper to consumer markets. Small entrants have a good position if they develop a niche, often as a craft, artisanal, or healthy option. | TF contributes to building networks and joint R&D and offering within the ecosystem. |
| Financial system | Limited access to venture capital in general, access to int'l VC very competitive and limited, R&D subsidies and loans, export loans and guarantees available. | TF funding directly contributes to R&D and exports. |
| Regulation | Food regulation is largely driven by EU | n/a |
| Education and research system | Food industry related education is offered at collegiate and graduate levels food biotechnology, food chemistry and food economics in selected colleges and universities, and Natural Resource Institute works with the food chain actors. Secondary education is focused on hospitality industry and primary or secondary processing. | TF RDI and export programs directly contribute to gathering industry and research institutions together for collaboration. |

... TABLE 5.

| FACTORS OF COMPETITIVENESS | ECOSYSTEM CHARACTERISTICS | TEAM FINLAND (TEKES, FINPRO, FINNVERA) ACTIVITIES/CONTRIBUTION |
|---|---|---|
| Intermediaries and knowledge transfer | At least one accelerator operates with the incumbents in the food industry. The RDI programs and export program act as a platform for knowledge exchange. | TF RDI and export programs directly contribute to gathering industry and research institutions together for collaboration. |
| RDI policy / innovation | The latest joint PPP strategy for the food industry is from Sitra's past food industry program 'ERA' (2006), Ministry of Agriculture has published more recently a strategy for potato products (2011), and a report on Food Policy 'Food2030' (2016) . Technical Research Center of Finland has published a 'Food Industry 4.0' vision on their own behalf (2017) | TF RDI program Sapuska was a sequel for the Sitra ERA program, and the present Fiilis RDI and Food from Finland exports programs are the follow-up. TF has contributed to development of new food products and processes that have since been launched to international markets in exports program. |
| Cultural (entrepreneurial) framework | Traditionally bulk of the market is dominated by large incumbents. Smaller enterprises are commonly specialized and/or artisanal 'craft' producers. The recent trends have enabled creation of more brand and quality focused smaller enterprises. | TF actions support starting up and developing new high-value products, offerings, and upgrading value chain positions. |

# MARITIME & OFFSHORE ECOSYSTEM

## OVERVIEW AND CURRENT DEVELOPMENT TRENDS

There is a long history of particularly ship building and offshore construction in Finland. Maritime & Offshore industry employs around 30 000 people in 900 enterprises, with a combined turnover of € 8 billion and most of it is export income (Meriteollisuus Ry 2017). Finnish shipyards are nowadays quite tightly specialized in building high-value specialty vessels including high-grade cruise ships and arctic vessels such as multi-role ice breakers and supply vessels, and ice-capable tankers. The Finnish ecosystem also houses some of the world leading systems suppliers, especially for power trains and propulsion systems, as well as other modules like cabins, bridges, kitchens etc. The exact figures depend on the source and definition, but generally under a half of Maritime and Offshore turnover in Finland is tied to Finnish shipbuilding and in fact the systems suppliers are a larger business.

The global trends in maritime & offshore are tied with general economic development, trade and energy policy. The bulk of registered tonnage is in cargo shipping, both container and bulk, which depends on the development of global shipping in general. At the moment, shipping and shipbuilding are suffering a setback despite general

growth in world economy, as several new entrants to the shipbuilding market some years back resulted in overcapacity both in shipbuilding and built vessels. While this has not affected shipbuilding in Finland specifically (as cruise ships are in demand), it does affect the systems suppliers. For other maritime sectors, offshore oil & gas is suffering due to low oil prices while offshore wind is on a more sound basis. Cruise industry is growing and investing since the global economy is growing. Technology trends include more connectedness and IoT, as well as continuing strive for efficiency, fuel saving and reduced emissions. (Brown, Carnie and Incecik, 2017; IHS Maritime, 2017)

## DEVELOPMENT OF THE ECOSYSTEM

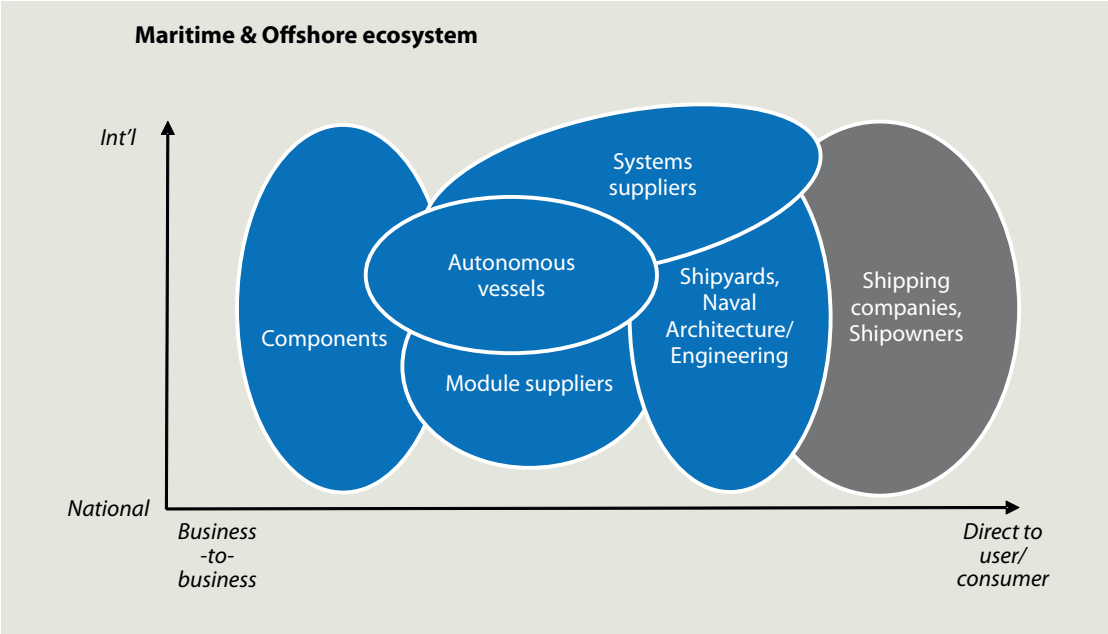
In general, despite the shifting economic tides, the value chains in the Marine & Offshore industry are relatively stable. However, the new rising opportunity is autonomous and remote-controlled vessels. Remote controlled or completely autonomous vessels offer safety and above all efficiency of operation. They also have potential to significantly change the traditional shipping industry and the roles between ship-owners, brokers, cargo owners and logistics operators. As an example, the first functional autonomous vessel, currently in final design and testing, is a container feeder commissioned and operated by an industrial company unrelated to established shipping industry. Besides ownership, value chains in terms of technology are also in risk of changing. For example, the automotive and aerospace industries have developed autonomous operation technologies that may have bearing in vessels as well. And, while the technology in modern vessels is already IT-infused, autonomous vessels will be even more connected and communication technology and IT platforms gain importance. Thus, also traditional IT-enterprises may have an opening to enter the industry. It is also foreseen that ownership of the IoT platforms, communication buses, standards, and the recorded operating data is the next battleground between shipbuilders, operators, and technology suppliers. Another trend, that is less dramatic, ship-owners increasingly convert vessels from traditional diesel propulsion to electric propulsion systems in search of efficiency and maneuverability. This after-market has created lucrative opportunities for Finnish enterprises as well.

In parallel with the development of autonomous vessels, also other changes are happening in the value chains. Shipyards are purchasing increasingly large portions of vessels from their modules suppliers and prefer to deal with a limited number of suppliers. This has started a trend that current systems suppliers are consolidating with their smaller competitors and gathering larger offerings, in effect taking increasing responsibility for coordinating the actual shipbuilding and in some cases also taking charge of the customer relationship.

## TEAM FINLAND CONTRIBUTION

Team Finland activities in Maritime and Offshore include the Arctic Seas RDI program and the on-going export program. Differing slightly from the other eco-

**FIGURE 15.** Value chain position of the Maritime & Offshore ecosystem.




systems described here, export credits and guarantees from Finnvera are elemental to the export capability of the shipbuilding industry, due to the standard payment agreements. The RDI programs have been important especially for systems suppliers in aiding development of technologies and also anchoring R&D to Finland. Export programs, in turn, play a key role in sales especially for governmental contracts, and also gather the industry actors together for proposing joint offerings. Specifically from the Maritime and Offshore perspective, the present RDI programs that focus more on value capture and are generic in nature are hard to position to for many of the enterprises in the ecosystem. Recently Team Finland has funded network projects, such as the One Sea Autonomous Ecosystem that brings together leading enterprises, including leading modules suppliers, a shipyard, a shipping company and IT providers to work towards developing autonomous vessels. The network links with earlier PPP programs such as DIMECC's Design for Value (D4V) program that seeks to digitalize and automate industry supply chains on the portside. D4V builds on earlier SHOK programs that focused on digitalization and building relational business networks.

Going forwards, the trends are towards increased connectedness and autonomy of navigation, and in that sense the Finnish ecosystem, is again potentially well-positioned to answer to these new demands. Another one of the trends is that shipyards are buying larger sub-sections and modules from the systems suppliers, to the point where lead suppliers may inherit most of the responsibility for the built vessel. In this landscape investment in development technologies for systems and specialty vessels is likely increasingly founded. Traditionally maritime & offshore and cruise/shipping industries have had a special position due to their strategic value and significance to supply security, and they have been well-subsidized directly and indirectly, which is similar to many other countries. However RDI subsidies and other support measures have had a relative minor volume or position in this larger scheme.

**TABLE 6.** Summary analysis of the maritime & offshore ecosystem.

| FACTORS OF COMPETITIVENESS | ECOSYSTEM CHARACTERISTICS | TEAM FINLAND (TEKES, FINPRO, FINNVERA) ACTIVITIES/CONTRIBUTION |
|---|---|---|
| *External* | | |
| Trends in global demand | Shipping trends and consequent demand for shipbuilding are cyclical and depend on world economy and trade. The technological trends are towards increased integration of IT and efficiency of operation, and as the latest larger frontier, vessel autonomy. | TF has offered RDI and export program funding specifically for these themes. |
| Foreign direct investment | Major FDI in shipyards, engineering, and software enterprises. | TF has contributed to maritime and offshore, and helped anchor R&D and operations in Finland through RDI and exports programs and export loans and guarantees. |
| Structure and dynamics of global value chains | Very capital intensive and dominated by large multinationals. Shipping industry and brokers have a major role as buyers, and traditionally shipyards act as a node in the value chain that collects the network of providers for a joint offering. In recent years modules and systems suppliers have however gained more traction in dealing directly with the end user and have gained more responsibility in the value chain. | TF support has contributed to developing higher value products and gaining a better position in international value chains. |
| Policy and regulatory environment | Maritime regulations are partially international (e.g. IMO SOLAS and other conventions), but on coastal waters safety regulations vary wildly between jurisdictions and intended use, for example around the North Sea crews and vessels may have six different sets of regulations within a day's sailing. | TF produces relevant target market information. |
| International mobility and knowledge flows | Maritime and Offshore is a very international sector and exports driven. Finnish enterprises operate in multiple locations across the world with various partners and vice versa. | TF funding contributes to anchoring and building up existing R&D. |
| *Internal* | | |
| Domestic demand and markets | Domestic market is relatively small, except for cruise ships. | TF funding contributes to building higher value goods and branding for domestic and export market. |
| Company system and economic structure | Large incumbents have a strong position, Finland has highly developed shipbuilding industry, and some of the world leading systems and module suppliers for propulsion systems, load handling and cabin modules. | TF contributes to building networks and joint R&D and offering within the ecosystem. |
| Financial system | VC not very relevant, R&D subsidies and loans, export loans and guarantees available. | TF funding directly contributes to R&D and exports. |

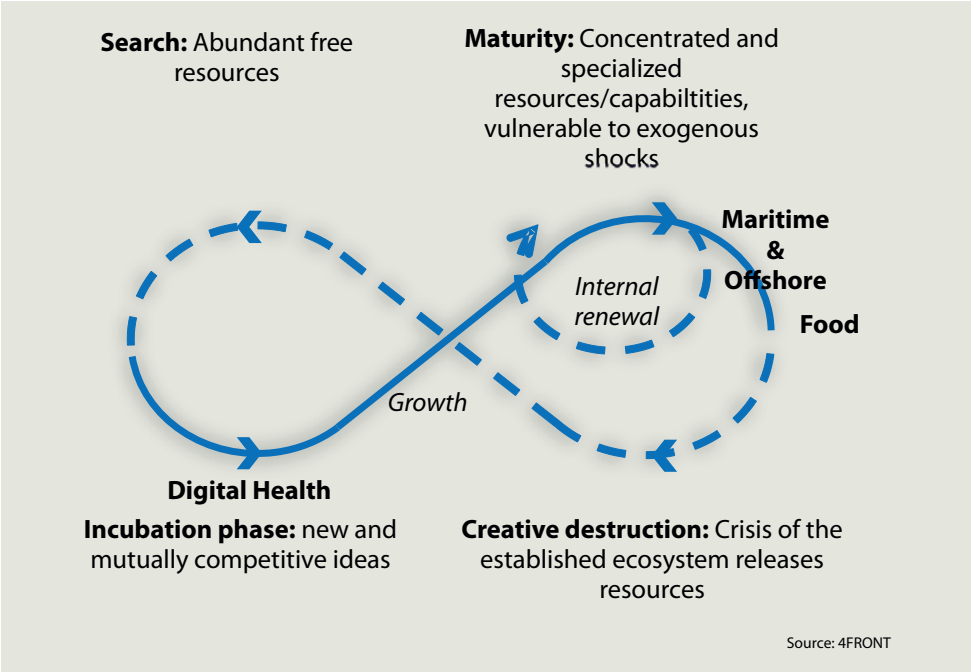
**... TABLE 6.**

| FACTORS OF COMPETITIVENESS | ECOSYSTEM CHARACTERISTICS | TEAM FINLAND (TEKES, FINPRO, FINNVERA) ACTIVITIES/CONTRIBUTION |
|---|---|---|
| Regulation | Maritime regulation is largely international. | n/a |
| Education and research system | Finland has a strong tradition in engineering education, of late especially in IT. However other relevant disciplines such as mechanical engineering has been on decline. | TF RDI and export programs directly contribute to gathering industry and research institutions together for collaboration. |
| Intermediaries and knowledge transfer | Traditions in collaborative research in various RDI programs has been the main venue, to the extent that advanced R&D is to some extent dependent on collaborative research with universities and research institutes. | TF RDI and export programs directly contribute to gathering industry and research institutions together for collaboration. |
| RDI policy / innovation | Maritime & offshore is featured in Finland's Arctic Strategy 2013 as one of the key focus areas. Maritime industry has published an R&D strategy 'Maritime cluster strategic research agenda 2017-2025', and a new autonomous vessel R&D program ecosystem has recently started as a PPP. | TF has had targeted RDI programs for maritime and offshore, latest one focused on arctic conditions, and an export program. Maritime & offshore is also a large client segment for Finnvera loans and guarantees.<br>The earlier TF-funded SHOK activities have continued through the period. |
| Cultural (entrepreneurial) framework | Dominated by large incumbents. Maritime and offshore is a capital intensive industry with long lead times. Smaller enterprises are commonly specialized suppliers. | TF actions support starting up and developing new high-value products, offerings, and upgrading value chain positions. |

## CROSS-CASE ANALYSIS AND CONCLUSIONS FROM THE ECOSYSTEMS

First looking at the ecosystems and their development stage: The following figure represents the generic life-cycle of an industrial ecosystem as an extension to the S-curve, from early search phase through growth to maturity and renewal or decline and rebirth. Looking at the studied ecosystems, Digital Health as a combination of healthcare and IT competence is in the search phase still forming structures and finding business models. Food and Maritime & Offshore are stable industries with defined value chains, incumbent actors and established relationships, and these current developments appear as internal renewal, in the sense that the new value creation is largely driven by the incumbent actors. What this entails in terms of Team Finland instruments and activities, there is more start-up and entrepreneurial-type activity in digital health than the other two.

**FIGURE 16.** Stages of ecosystem development (Salminen & Halme 2017).




Considering the stakeholder views, there is a distinct difference in perspective between the enterprise level and ecosystem or program level. At the enterprise level the stakeholders tend to view the instruments through the lens of the organizations' own strategies, development agendas, and roadmaps. From the enterprise perspective, the affordances of Team Finland programs are generally that they enable building new skills and competence and solving technological and business problems faster or in a larger scale than otherwise would be possible. Additionally, newer entrants view participation in the programs as an opportunity to learn the industry structures, get relevant information about the market and potential customers and enter the industry networks. The latter is mirrored also by more established enterprises who report that one of the benefits is meeting new potential partners.

At the program level, according to the stakeholders, the programs contribute to building new collaborations by bringing together different types of actors and new combinations. Across stakeholder groups, the common opinion is that successful program implementation hinges on in-depth understanding of a particular industry, its markets, customers, value chains and networks. These are the factors that enable designing the small details of program implementation, such as selecting 'the right' trade fairs and stakeholders to invite in various events and in general imparting profound advice. Relatedly, there is critique that the recent and present Tekes/Team Finland RDI programs are focused on generic or horizontal topics, such as value capture, digitalization etc. This is challenging especially for new entrants, who would benefit the most from industry-focused programming, the technological or innovation laggards, and the incumbent enterprises who have a sharp technological focus and a niche in the market. The stakeholders asked where does for example a new energy-efficient heat exchanger go in these programs, or a variable-frequency-variable-voltage inverter topology optimized for asynchronous AC motors?

Overall these comments highlight the heterogeneity between industries and enterprises. Industries and ecosystems have their life-cycle as discussed above, and so do enterprises and their technologies. New entrants, small actors, or laggards typically benefit from industry specific programs and instruments, while large and innovative enterprises typically thrive better in generic/horizontal programs. Based on the feedback, within an industry there is simultaneous needs (even within the same actors) to develop technology (exploration, value creation) and horizontal competence (exploitation/value capture). It is a generic finding in industrial economics, that too much of focus on either leads to sub-optimal total value capture. Consequently, the data suggest that both horizontal 'generic' and vertical industry-focused programs are founded, and it cannot be said either type would in and of itself serve internationalization better.

As a part of the analysis of the ecosystem, we gauged how the stakeholders see ecosystem formation and how this development could be even better supported. The challenge in ecosystems is that they are in the end borne out of mutual interest between parties that creates an incentive to build collaborative relationship. Colloquially, the members of the ecosystem all need to be able to win something by collaborating. Innovation (eco-)systems literature stresses factors such as market/demand and legitimation of technologies, sufficient knowledge production and flows between actors, and adequate finance. (Negro and Hekkert, 2008; Bergek *et al.*, 2015; Industrial Innovation in Transition, 2017). As such Team Finland instruments already address this by bringing actors together in joint program events and funding collaborative projects. Going further in supporting ecosystems, referring to the figure above, the time to act is when a mature industry is stagnating and the established business models and technologies, products or services are facing challenges. In these cases Maritime and Food represent mature industries where established models have been challenged. Alternatively the case can be made if there are free resources or when there is an entirely new market that enables combining existing capabilities in a new way, as is the case in Digital Health. Regarding demand and user perspective, the recent ecosystem programs have broadened collaboration from Public-Private Partnership model towards integrating lead users to development, which is exemplified in CleverHealth and One Sea.

The challenges for supporting ecosystems are that typical policy interventions and instruments either address general framework conditions such as regulation, or they are enterprise level funding, while ecosystems are a more ephemeral construction between the stakeholders. While both framework conditions and specific instruments are important, the quintessential challenge is that mutually competitive enterprises find it difficult to engage in fundamental RDI together, as developing really new and 'the best' ideas with competitors has an inherent contradiction (for a lengthier discussion see, e.g. Piirainen *et al.*, 2017). Accordingly, recent research has highlighted the importance of network engines that

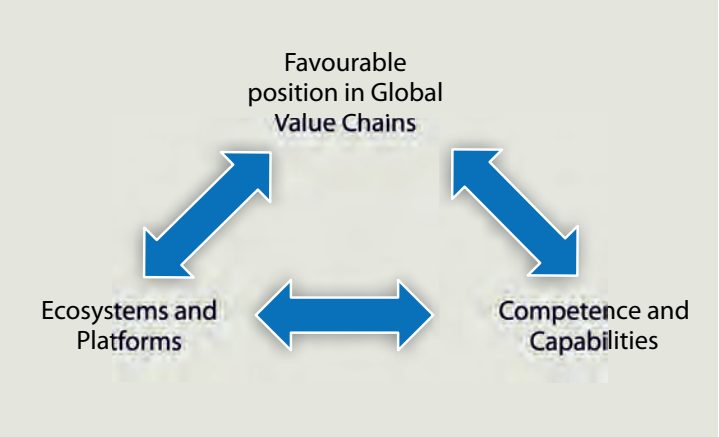
coordinate the system development (Industrial Innovation in Transition, 2017; Piirainen *et al.*, 2017). As a general finding large incumbents tend to have their own 'ecosystems' as in established networks of suppliers and partners, which are relatively closed and moderated by the network engine. This is echoed in the interviews, where it is said that RDI funding should be more 'directed' and 'more choices' should be made, which in practice implicates to trying to predict and winners among technologies and enterprises or ecosystems. This last point is however challenging from the standpoint of innovation policy as a repair for market failures. On the other hand, the recent ecosystem programs such as One Sea illustrate how the industry self-organizes ecosystems and uses RDI funding as leverage. These sorts of arrangements may provide an avenue for externalizing the problem, as long as there is a transparent selection mechanism for how ecosystems are rated.

# PATHWAYS TO DEVELOPING TEAM FINLAND COLLABORATION

The forward-looking workshop was organized between Team Finland actors December 14th 2017 with 25 participants. The purpose of the workshop was to build on the analyses presented above, reflect on the findings towards the future development of Team Finland collaboration and propose courses of action towards the future.

The workshop followed the GRIP approach for collaborative roadmapping-type exercises (Piirainen, 2014). The workshop started with presentations of study findings and orientation, and proceeded to first identify current challenges, and then to identify actions for developing Team Finland collaboration. The context for the workshop was aligned with Government priorities of making Finland a top innovation environment as presented in the following figure. The Government priorities are to gain a favorable position in global value chains, and to achieve that development of competence and suitable platforms and ecosystems is prioritized. The previous section has studied the Finnish position in global value chains, and the workshop focused particularly on ecosystems and capabilities.

**FIGURE 17.** To be a top innovation environment, how can we assure we have the necessary…?




The first step in the workshop was to identify the challenges in Team Finland collaboration that need to be addressed. The following figure is a summary of the challenges perceived by the Team Finland actors themselves. They fall into four broad categories:

1) access and position in global value chains,
2) international business competence,

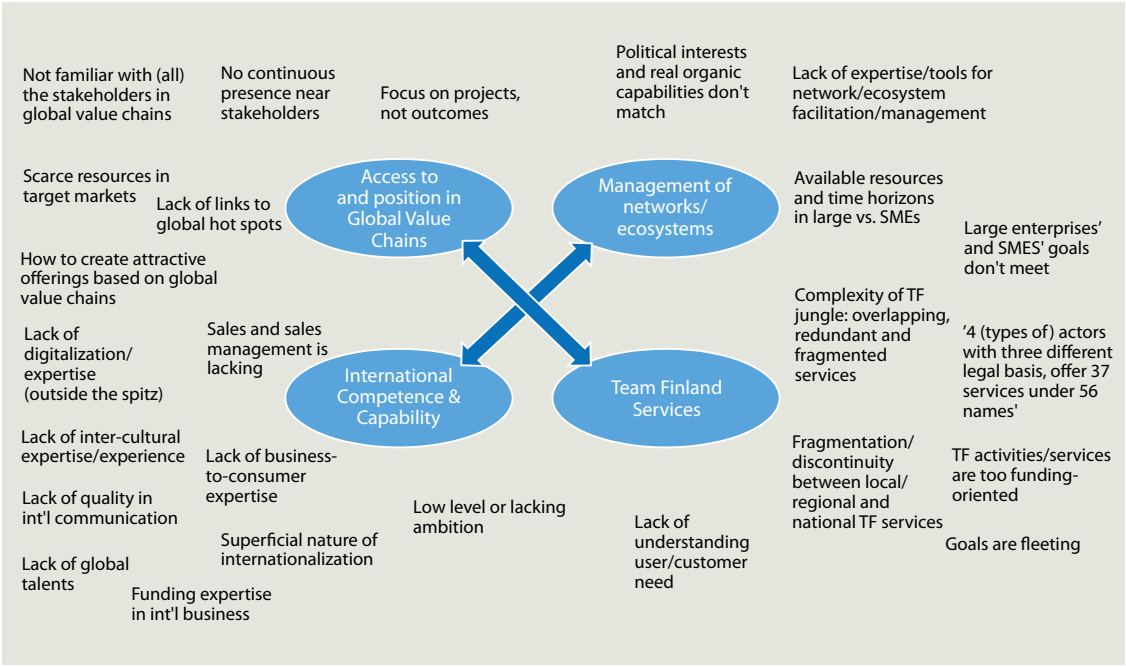
3) management of networks and ecosystems, and
4) Team Finland services.

The first two on left side of the figure concern the client side, and the latter to pictured on the right are more internal to Team Finland. Summarizing in very broad strokes, on the client side the two main challenges are lack of presence and insight in the target market, and lack of international sales competence. The perception of lack of foothold in global innovation hotspots and value chains was common between Team Finland and the client enterprises. On Team Finland side the main challenges are fragmentation of services and lack of coordination across the network and difficulty in finding added value for the different customer groups. Ecosystems has been a rising trend in RDI policy, and there the challenges related to finding 'tools' for managing ecosystems and creating added value for the stakeholders, as well as selection of the ecosystems.

In the following phase the work moved to finding solutions and steps to towards building even better Team Finland collaboration. The discussion between the workshop participants brought forth avenues for developing Team Finland collaboration.

Related to challenges 3 and 4 discused above, it was recognized that various actors at different levels of the innovation system, within and outside Team Finland network, have overlapping service offerings and a lack of common goals and coordination between various agencies. The view was that there is a need for developing a consistent customer path and understanding the overall Team Finland portfolio of service providers and services. The agreement was that There should be two tools for Team Finland consultants or administrators. First ideas was a triage scheme was proposed in the workshop to diagnose how motivated the clients, are and how broad are their needs for services. This would enable concentrating scarce resources on clients that are focused and motivated to seek international growth. Second, was developing a diagnostic tools to enable offering the right support instruments in the right phase of enterprise life and phase of internationalization, with a working name

**FIGURE 18.** Identified challenges in Team Finland collaboration.



Team Finland Navigator. This directly relates to developing a specific service path for the clients and it should include an up-to-date overall map what services are available for enterprises from different Team Finland actors for their path from starting up to innovation and international markets.

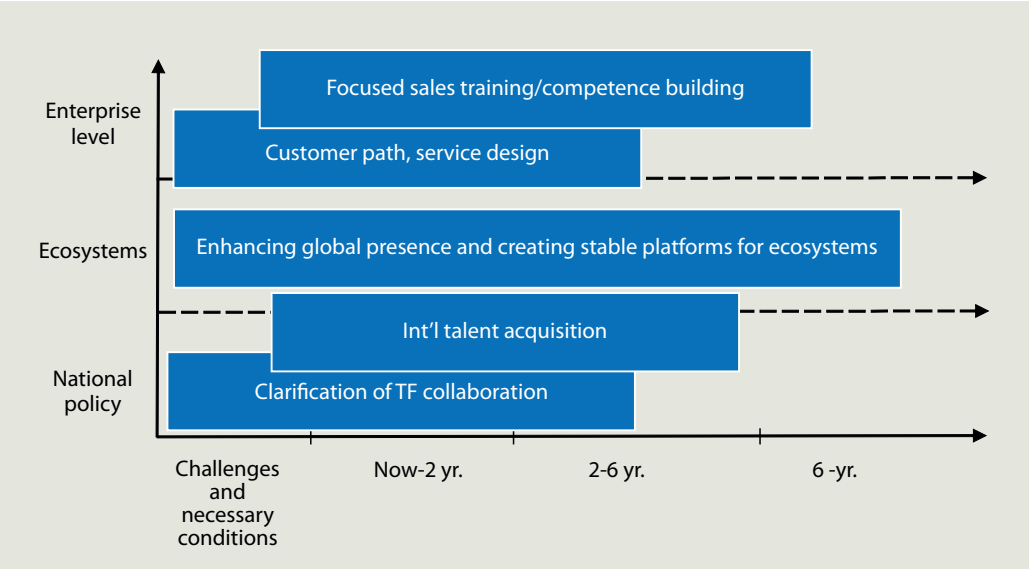
Another, related, discussion was that Team Finland and the various constituents of the network have been under constant development and change during the recent years. Despite the efforts, the current goals and strategy have been unclear at any given time for many Team Finland employees, and the same basic challenges have to an extent followed TF over development cycles. The consensus was that there is a need for a clarification of goals and responsibilities and more comprehensive change management throughout the network. The view was that there is also a need to focus and invest in core activities: developing a service platform, investment in international presence, local markets, networks and programs to support internationalization and related business skills.

This latter is related also to the discussion around challenges 1 and 2. The perception between the actors was that on average international business skills are lacking in Finnish enterprises together with general international orientation. This is tied to relatively low presence in international markets and lack of knowledge of foreign business conditions outside the multinationals that actively engage with global value chains already. The solutions that were discussed ranged supporting international talent acquisition to straightforward sales training. There was also a proposal for a general business support instrument for internationalization, that mirrored the Danish Vitus instrument described above in Section 3. Regarding ecosystem building, the discussion boiled down to recognition for the need to build on existing networks and accumulated knowledge and provide a stable platform for ecosystems. The specific suggestion was to develop consortia of enterprises based on mutual interest to develop joint offerings, as a way to aid less prepared clients into international markets in the slipstream of more experienced and networked ones.

The following figure condenses the proposed future actions on levels as they concern either national policy, industries or ecosystems or individual enterprises. At the enterprise or Team Finland client level, the most important emerging themes for development were building a clear path for customers and TF actors through the different services, to enable informed choice of support for the stage of technology, business, and internationalization for each customer. In parallel, development of general international business, and particularly sales, skills were seen as critical. There is a perceived lack of international market development and sales proficiency, inter-cultural understanding etc. The ideas mentioned were developing Young Innovative Companies-type or general business support grants for sales development and developing training and education for international sales.

At the ecosystem level, developing stronger international presence was seen as paramount, both for the industry and Team Finland. This also includes developing

**FIGURE 19.** Key actions for Team Finland for the following years.




international presence and platforms for Team Finland services. Relatedly, international talent acquisition is another action that was intertwined with both international business competence building and enhancing global presence. Lastly, the final action is clarifying the goals, roles and responsibilities between the Team Finland actors.

Based on the discussion and collected ideas, the following figure sketches a development vision for Team Finland, where the national, regional and local actors have common goals and basic understanding of each other's services; the regional actors act as roots and direct clients forward to Business Finland that acts as a trunk and implements RDI and ecosystems policies, which feeds the crown of individual enterprises and national ecosystems that grow towards global markets. Operatively the Team Finland Navigator was concluded to be the 'low hanging fruit with most benefits for the client companies, consultants and TF.

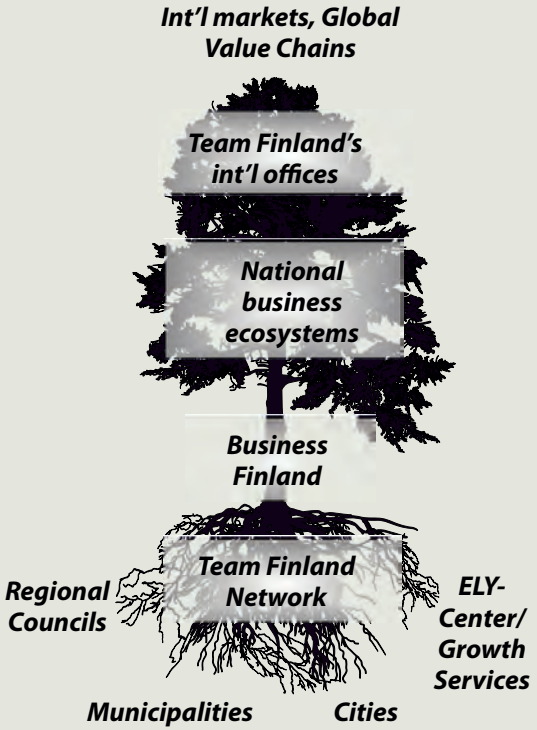
The operative elements in the vision include

1) clear responsibilities and coordination between Team Finland actors,
2) clear customer path between different services,
3) predefined service options at each life-cycle stage, a new updated service Navigator, and finally,
4) account managers responsible for the customer relationship.

**FIGURE 20.** A sketch of roles in Team Finland network (Picture background: Shutterstock).

Goal state

- Coordination within Team Finland
  - Clear responsibilities or path between different actors
- Clear customer path between actors
  - Account managers responsible for the customer relationship
  - Predefined service options at each stage, a new updated service Navigator



# CONCLUSIONS

*Team Finland* – as an umbrella organization – has been in turmoil through its short history and the three organizations under review have undergone major changes. Finnvera saw the demand for its services first to explode in the aftermath of the 2009 financial crisis and then to even out, as companies grew more cautious with their investment plans. Finpro has been in constant flux in the observation window: other export and foreign investment promotion activities have been merged into it; Finpro has sold off and discontinued its consultancy businesses and reorganized its remaining activities. Tekes has faced severe budget cuts in the observation window and has simultaneously shifted its emphasis from established companies to startups.

## EARLIER WORK

The academic literature we review finds that innovation, internationalization, and enterprise growth are intimately related. Indeed, it suggests that advancing any one of these factors independently might be inefficient and calls for coordination of internationalization, innovation, and growth policies. Even though relevant studies are few in number, the academic literature thus lends support for *Team Finland* and *Business Finland* type of organizations.

*Team Finland*, and all the three organizations under review in this study, have been evaluated recently. Salminen *et al.* (2016) saw *Team Finland* growth programs as a functional and welcomed tool. They nevertheless called for deeper cooperation between the service providers and more efficient resource utilization.

Evaluations considering *Finnvera, Finpro,* and *Tekes* typically find that these organizations are well run, and their services are appreciated by client companies. Quantitative evidence on their impact is often found to be positive, albeit mixed. I.e., statistically significant impacts are found in some – but not all – dimensions, time periods, or client groups.

## TEAM FINLAND -LIKE PRACTICES IN COMPARISON COUNTRIES

All the four comparison countries – Sweden, Denmark, the Netherlands, and Ireland – have similar basic services for promoting innovation-led export growth, although

the specific organization structures for organizing these services vary. All countries except Finland a have an explicit export strategy that is in many cases intertwined with development cooperation.

The basic services across the countries include information on target markets and possible regulatory or other trade barriers, and export credits or guarantees. Besides these basics, there are, for example, vouchers and various types of grants. Comparing the services offered in the comparison countries to Team Finland export programs, and the feedback discussed below, it seems that the program model is an efficient way to offer the services.

## QUANTITATIVE EVIDENCE ON THE THREE TEAM FINLAND ORGANIZATIONS

Currently, almost half of internationally-oriented SMEs in Finland are customers of at least one of the three organizations – *Finnvera, Finpro,* or *Tekes*. Being simultaneously (±1 year) a customer of all three organizations is nevertheless quite rare and is the case for some 6 % of the target population.

In our quantitative analysis, we do not observe large-scale "feeding" from one of the three organizations to the two others. We nevertheless observe that over time it becomes increasingly common for the target companies to engage with more than one of the three organizations.

We device an econometric setup to isolate the additional causal impact of *Finnvera, Finpro,* or *Tekes* support. The idea is to compare the difference in over-time development between treated (or supported) and non-treated companies (not supported but otherwise similar in observable dimensions). For each of the three organizations, we perform this econometric analysis in six dimensions: employment growth in Finland and abroad, turnover growth in Finland and abroad, growth of exports from Finland, and growth of labor productivity in Finland.

In the cases of all three organizations, we find evidence of positive and statistically significant impacts, albeit not in all the considered dimensions. Oftentimes these impacts show up with some lag. Domestic impacts tend to be stronger than international ones.

## QUALITATIVE ANALYSIS ON TEAM FINLAND AND THE THREE ORGANIZATIONS

The qualitative analysis adopted an ecosystems approach focusing on three existing or emerging ecosystems: Health, particularly Digital Health, Food, and Marine & Offshore. Out of the studied ecosystems, Digital Health as a combination of healthcare and IT competence is in the search phase still forming structures and finding business models. Food and Marine & Offshore

are stable industries with stable incumbent actors and established relationships and these current developments appear as internal renewal.

From the enterprise perspective, Team Finland programs enable building new skills and competence and solving technological and business problems faster or in a larger scale than otherwise would be possible. Additionally, newer entrants view participation in the programs as an opportunity to learn the industry structures, get relevant information about the market and potential customers, and enter the industry networks. The latter is mirrored also by more established enterprises who report that one of the benefits is meeting new potential partners. At the program level, Team Finland programs contribute to building new collaborations by bringing together different types of actors and new combinations. The common opinion is that successful program implementation hinges on in-depth understanding of a particular industry, its markets, customers, value chains and networks.

## TEAM FINLAND ACTORS' VIEWS ON TEAM FINLAND COLLABORATION AND ITS FUTURE

Summarized very briefly, the two main challenges of the Team Finland clients are the lack of presence and insight in the target markets and the lack of international sales competence. On Team Finland side the main challenges are the fragmentation of services, the lack of coordination across different organizations and levels, and the difficulty in finding added value for the different customer groups.

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Brief responses to the questions imposed in the original call/proposal (please see Executive Summary for a synopsis).

| EVALUATION QUESTION(S) | METHODOLOGY | FINDINGS | CONCLUSIONS | RECOMMENDATIONS |
|---|---|---|---|---|
| QA1: What is the economic performance of **Tekes**-funded internationally oriented SMEs in 2009-2016? | – Econometric assessment: Coarsened exact matching and difference in differences. | Of the six measures considered, an intervention by Tekes has a statistically significant and positive impact on one, domestic employment. Two other measures, sales in Finland and exports from Finland, are positive and close to being statistically significant. For the remaining three measures, the statistical significance of the results is too low to make reliable inference. | While these findings are not a definite proof, they are consistent with Tekes fulfilling at least some of its enterprise policy missions as well as it having sensible operational practices. | This evidence, or the other evidence we've gathered, does not call for major organizational changes at Tekes. The challenges we observe are mostly related to Team Finland -level activities. We find the establishment of Business Finland a positive development, primarily because it removes one major organizational boundary within Team Finland. We hope that Business Finland does not dilute enterprise policy's overall emphasis on innovation policy. |
| QA2: What is the economic performance of **Finpro**-promoted internationally oriented SMEs in 2009-2016? | – Econometric assessment: Coarsened exact matching and difference in differences. | Of the six measures considered, Finpro's intervention has a statistically significant and positive impact on two, domestic employment and sales in Finland. Two other measures, employment abroad and exports from Finland, are positive and close to being statistically significant. For the remaining two measures, the statistical significance of the results is too low to make reliable inference. | While these findings are not a definite proof, they are consistent with Finpro fulfilling at least some of its enterprise policy missions as well as it having sensible operational practices. | This evidence, or the other evidence we've gathered, does not call for major organizational changes at Finpro, although the organization is still in flux with the changes that have already taken place in recent years. The challenges we observe are mostly related to Team Finland -level activities. We find the establishment of Business Finland a positive development, primarily because it removes one major organizational boundary within Team Finland. |
| QA3: What is the economic performance of **Finnvera**-funded internationally oriented SMEs in 2009-2016? | – Econometric assessment: Coarsened exact matching and difference in differences. | Of the six measures considered, Finnvera's intervention has a statistically significant and positive impact on two, sales in Finland and domestic labor productivity. For the remaining four measures, the statistical significance of the results is too low to make reliable inference. | While these findings are not a definite proof, they are consistent with Finnvera fulfilling at least some of its enterprise policy missions as well as it having sensible operational practices. | This evidence, or the other evidence we've gathered, does not call for major organizational changes at Finnvera. Given the focus of the evaluation, we did not consider export credit guarantees, which have expanded since the 2008-2009 crisis and are currently evaluated in another effort. The challenges we observe are mostly related to Team Finland -level activities. |

| EVALUATION QUESTION(S) | METHODOLOGY | FINDINGS | CONCLUSIONS | RECOMMENDATIONS |
|---|---|---|---|---|
| QA4: What has been the role of Tekes, Finpro and Finnvera to improve innovation-led export growth? | – Econometric assessment: Coarsened exact matching and difference in differences.<br>– Workshop: GRIP-method workshop for TF stakeholders. | Tekes, Finpro and Finnvera have statistically significant impacts on their clientele and thus they have contributed to growth of these SMEs. However, since these firms are typically rather stable and grow slowly and the observation window coincides with a dismal performance of the Finnish economy at large, the growth rates are not particularly large. For example: In four years after a Tekes treatment, an average firm in this population grows its domestic employment by 1.1% p.a. (-0.8% for a similar non-treated). In four years after a Finnvera treatment, an average firm grows (or contracts) its sales in Finland by -0.2% p.a. (-0.7% for a similar non-treated firm). In four years after a Finpro treatment, an average firm grows its sales in Finland by 1.7% (-0.8% for a similar non-treated firm). In our statistical analysis, we observe a market increase in the population coverage of the three Team Finland organizations, which is one indication of their growing signifance in this target group. Our econometric evidence only concentrates on the direct firm-level impact. Our workshop and stakeholder interviews suggest that Finnvera, Finpro and Tekes serve a significant role in ecosystem building and the firms value interaction with other firms. | Tekes, Finpro and Finnvera have a measureable impact on innovation-led export growth. However, at least in this target group, their impact is arguably more important in inducing interaction among firms and other organizations as well as building systemic competences. | Compared to the time before its existence, Team Finland represents an improvement. We endorse the transfer of Team Finland coordination to The Ministry of Economic Affairs and Employment. Nevertheless, we wish to emphasize that other ministries should remain fully engaged. The expanding coverage of Team Finland and the higher likelihood of simultaneously being a customer of multiple Team Finland organizations necessitate customer relationship management across the separate organizations under the Team Finland umbrella. However, this does not currently occur in a well-coordinated manner, even though each individual organization is quite capable of handling its own customers. |

| EVALUATION QUESTION(S) | METHODOLOGY | FINDINGS | CONCLUSIONS | RECOMMENDATIONS |
|---|---|---|---|---|
| QA5: Which factors in the Finnish operating environment in general help and prevent the impact of Tekes, Finpro and Finnvera activities when considering the improvement actions to innovation-led export growth? | – Ecosystems approach: Impact cases based on company interviews.<br>– International benchmarking: Team Finland-like approaches of Denmark, Sweden, and Ireland.<br>– Literature review: Review and meta-analysis of academic and other relevant literature. | The literature points to a fundamental challenge in both policy conduct and its measurement: a group of firms tend to be good in many things and they are active and successful in solving challenges they face both via internal efforts and external help. These firms may not need much active policy support; if they nevertheless receive it, measured outcomes have a tendency to look good. There are also exact opposites of these firms, which are obviously not attractive policy targets. The sweet spot is in the middle: among firms, in which an intervention can induce a behavioral change that would not have happened otherwise. Another observation from the literature is that innovation, internationalization and growth are intimately interlinked. | Policies attempting to advance innovation, international, and growth should be considered in tandem, even though this consideration does not necessarily mean that they should be organizationally integrated or that the any given policy should address multiple goals. | Team Finland needs a Navigator, which provides an overview of the available services and helps to see the mix of services Team Finland offers to various company archetypes. The proposed Navigator would map a process for enterprise internationalization and the various Team Finland services for each stage. It would establish an overview of the Team Finland service portfolio and provide a common language for the providers and users of Team Finland services. Both the providers and users voted for a one-stop shop of Team Finland services but simultaneously acknowledged that it is currently far from reality and that the compelling idea of the one-stop-shop may not be entirely realistic. Instead, in our workshop, the discussion moved to promoting a "no wrong door" approach, in which the first point of contact in Team Finland would assume responsibility to learn the customer's needs and identify a suitable mix of services in the overall Team Finland palette. Additionally, when customers move from one Team Finland organization or actor to another, they would not simply be pointed forward but would be personally introduced to the new Team Finland contact. |

| EVALUATION QUESTION(S) | METHODOLOGY | FINDINGS | CONCLUSIONS | RECOMMENDATIONS |
|---|---|---|---|---|
| QB1: How the export activities in global value networks could be promoted? | – Ecosystems approach: Impact cases based on company interviews.<br>– International benchmarking: Team Finland-like approaches of Denmark, Sweden, and Ireland.<br>– Literature review: Review and meta-analysis of academic and other relevant literature. | According to the stakeholders, in the area of innovation-led export growth the Growth Programmes have been beneficial in bringing actors together and facilitiating formation of new partner constellations and joint offerings. When the networking aspect is paired with actionable market intelligence and buyer recognition the combination recives excellent feedback from stakeholders. Similar effects have been observed for the former Tekes RDI programs, with the difference that they have lead to more intensive RDI, but less directly to international or exports activities. Additionally the finding for the program themes is, that industry-specific programs are the most reachable and benefit especially new entrants, such as SMEs and technological laggards, while the horizontal themes are more challenging and cater best to already innovative enterprises. Within Team Finland, the perception is similar, but in addition the perception is that outside relatively few multinational enterprises and internationally-oriented SMEs, international business skills in general and specifically sales skills are lacking. | The program portfolio supports innovation-led export growth. The most fruitful combinations have been when an RDI/ technology program and exports program are sequentailly implemented, which lets the participants capitalize their innovation in export markets. In addition to present instruments, the international benchmarking highlights some instruments, particularly sales and international business training and NIY-type exports program, that could be further leveraged to innovation-led export growth. | The existing programs seem to be effective. The recommendation is to fine-tune programming to ensure synchronization of programmes. Additional targeted instruments could be considered specifically for international business training and aggressive internationalization. In international comparison, Team Finland presents itself as a loose guiding concept and a form of soft coordination. Countries that employ central leadership and tight coordination in similar activities have achieved greater efficiency and higher impact. In our view, Finland should also consider a more tightly knit collaboration and a more strategic approach. |
| QB2: How Tekes, Finpro and Finnvera could strengthen cooperation between large/ incumbent firms and firms with new business models that are disruptors or enablers in reconfiguring value networks? | – Ecosystems approach: Impact cases based on company interviews.<br>– International benchmarking: Team Finland-like approaches of Denmark, Sweden, and Ireland. | The present programs function as a platform for collaboration between incumbents and enterprises with new business models. Both RDI programs and Growth Programs have examples where new collaborations have been founded in the programs. Here again industry-specific programs may contribute more directly to ecosystem or network formation in less established industries or business areas, e.g. Digital Health. The already established industries, e.g. Food industry, are already rather networked. Overall the key challenge is to find mutual benefit for all parties. | The established way of organizing operations in programs creates networks within industries and/or ecosystems. | If networking is desired, the program activities should be maintained in some shape or form. Additionally, the role of intermediaries or activities such as matchmaking could be leveraged to accelerate partnering. The discussed concept with a working title is Team Finland Navigator, which charts the available Team Finland services and positions them on a generic enterprise and internationalization timeline, to create joint understanding of available services, both within Team Finland, and among customers and beneficiaries where each available service is targeted. |

| EVALUATION QUESTION(S) | METHODOLOGY | FINDINGS | CONCLUSIONS | RECOMMENDATIONS |
|---|---|---|---|---|
| QC1: What are the best tools and overall possibilities for Tekes, Finpro and Finnvera to the highest impact on innovation-led export growth in innovation and global value networks/ ecosystems? | Synthesis of all methodologies used:<br>– Econometric assessment.<br>– Workshop.<br>– Ecosystems approach.<br>– International benchmarking.<br>– Literature review. | The individual organizations and their activities are effective in supporting innovation-led export growth, as discussed above. In international benchmarking and the internal workshop, the suggestion was that deciding joint goals within Team Finland, developing further integration of services and consistent customer paths between organizations and their services/instruments would be the next step.<br>The case studies illustrate multiple possibilities, one being bringing industry actors together with market intelligence and potential buyers, which exposes enterprises to market requirements and incentivizes development of joint offerings. Another is supporting collaboration and renewal within existing value chains, which gives the possibility for less internationally active actors to slipstream their expertice and products to international markets. | The individual organizations work effectively in supporting innovation-led export growth, the challenge is inconsistent customer path between different Team Finland actors and their services. | Team Finland should develop more clear common goals and a distinguish clear customer paths between different Team Finland actors and their services. |
| QC2: When the promotion of various ecosystems requires a different mix instruments and flexible partnerships, how such collaboration model could be formed? | Synthesis of all methodologies used:<br>– Econometric assessment.<br>– Workshop.<br>– Ecosystems approach.<br>– International benchmarking.<br>– Literature review. | Team Finland has been in constant internal change recently. To develop policy or intrument mixes, it is needed to stabilize the Team Finland collaboration and develop a joint understanding what is the common goal between the constituent policy agencies and coordination mechanisms.<br>A concrete action that has been raised in this study is to build a map of various Team Finland services and possible customers paths within and between Team Finland actors' service offerings.<br>Ecosystem building as such falls between the national level where the framework policies are created and strategic goals are set, and Team Finland -level where policy instruments instruments are designed and implemented. | The existing program structures have been found effective for supporting innovation and internationalization. Developing internal collaboration of Team Finland would enable even more concerted and proactive planning of interventions. | Team Finland should develop a joint set of goals and internal coordination to respond to emerging needs. |

| EVALUATION QUESTION(S) | METHODOLOGY | FINDINGS | CONCLUSIONS | RECOMMENDATIONS |
|---|---|---|---|---|
| QC4: What are the future suggestions and recommendations on how actors of Team Finland (especially Tekes, Finpro and Finnvera) can improve their impact on the future innovation-led export growth of Finnish companies' global business? | Synthesis of all methodologies used:<br>– Econometric assessment.<br>– Workshop.<br>– Ecosystems approach<br>– International benchmarking.<br>– Literature review. | The present set of instruments has been found effective at the organization level. There are, however, gains in developing synchronization of programs and construction of more fluent customer paths between Team Finland services. The main challenges highlighted by the empirical study were perceived lack of international orientation, presence and networks, as well as international business skills for a large part of the enterprise population. | The basic instruments seem effective as such based on the evidence. However, impact would be likely reinforced through more careful syncronization of programming from (applied) research and development through to commercialization and internationalization. Additional long-term benefits could come from supporting general international orientation and business skills. | Team Finland should develop internal coordination even further to enable strategic and proactive policy implementation. |
| QC3: What are the expected impacts of closer collaboration between public organizations (especially Tekes, Finpro and Finnvera) over the next five years? | – Workshop: GRIP-method workshop for TF stakeholders | The international comparison showed that there has been a trend of consolidation of innovation-led export growth support service providers, in search of efficiency and effectiveness. It is expected that closer collaboration between Team Finland members will enable developing a more concerted and synchronized service offering. In the short term, it enables clients/beneficiaries to find the services that suit their needs best, which indirectly raises effectiveness. In the medium to long term, closer collaboration potentially enables more strategic and proactive approach to RDI policy implementation and raises efficiency and effectiveness of future interventions. | Team Finland collaboration follows a road signposted by similar developments elsewhere. It is expected that closer collaboration raises effectiveness. | It is recommended to develop closer ties and coordination mechanisms within Team Finland. |

| EVALUATION QUESTION(S) | METHODOLOGY | FINDINGS | CONCLUSIONS | RECOMMENDATIONS |
|---|---|---|---|---|
| QC5: What should be the main governmental-level policy targets and measures to promote innovation-led export growth in the Finnish economy? | – Workshop: GRIP-method workshop for TF stakeholders<br>– Ecosystems approach: Impact cases based on company interviews | The government program has set a vision that Finland will reinforce welfare state through sustainable growth, by supporting entrepreneurship and employment, among other things. The government program has set a speficic target that impact of RDI activities should be reinforced, and one of the key projects is to foster collaborations between universities, higher education and industry. The government has also specifically set a program to reinforce Team Finland Collaboration and position Business Finland as a coordinator. Separately, the newly re-formed Research and Innovation Council committed to a vision where Finland is the most attractive and competent environment for experiments and innovation in 2030. The vision stands on three legs that can be re-worded as competence and capability, platforms and ecosystems, and international mobility and position in global value chains. Overall, these targets are consistent and complementary with each other.<br>The impact study highlighted similar factors, such as the importance of position in global value chains, and importance of international business competence. | The governmental-level targets support innovation-led export growth and the findings of this study align with those. However, several concrete decisions and measures are in clear conflict of these targets. An example of these is the lowering of applied research budget appropriations, which have likely hurt collaboration between higher education, other research organizations and industry. | The national-level goals and objectives are broadly consistent and support innovation-led export growth, provided that they are consistently implemented. At Team Finland level, the key recommendations are to develop internal coordination and common goals and strategy, together with designing customer paths. |