

ERSA: Trade Policy and Trade Performance in Emerging Markets

Exporter dynamics in South Africa: The influence of foreign technology and information networks on survival

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PRESENTATION OUTLINE

I. Motivations and Background

II. Research question and contributions

III. Selected theoretical foundations

IV. Data and methodological approach

V. Results, conclusion, and recommendations

**The decline of
South African
exports is a
reality**

2014-2019: South Africa's export share of GDP declined by 6.2% (World Bank, 2025).

2022-2024: South Africa's export share of GDP recorded a decline of 5.6% (World Bank, 2025).

A direct sign of a loss in international competitiveness

The decrease in the number of products exhibiting a revealed comparative advantage (Bhorat et al., 2019; Edwards, 2021).

Only 25% of new exporters and a mere 7.7% of new exporter-destination-product relationships survive for the first three years in South Africa (World Bank, 2024).

Characteristics of manufacturing exporters in South Africa

A growing innovation gap, evidenced by declining business expenditure on R&D and reduced payments for foreign intellectual property, is undermining South Africa's export recovery (World Bank, 2017).

Statistics from the IMF(2024) and the Observatory of Economic Complexity (2025) indicate that South Africa's export bundle remains highly concentrated in a limited number of commodity products and destinations.

II. Research question and contributions

A review of previous studies on the drivers of export survival in South Africa and SSA

-Technological innovation (World Bank, 2024)

-Process innovation (Avenyo & Bell, 2022)

-Product innovation (Vannoorenberghe, G., & Vannoorenberghe, 2015).

-Export market features (Anand et al., 2016; Kusilika et al., 2021).

- Limited product market competition (IMF, 2016)

II. Research question and contributions

Two key limitations emerge from the literature

Foreign technology transfers are crucial for firm survival, though they are a limited topic in international literature.

Research on exporter survival, especially regarding *information networks*, is limited.

Therefore, what are the effects of foreign technology and information networks on the survival of exporting manufacturing firms in South Africa?

II. Research question and contributions

Contributions

To examine how foreign technology transfer influences the survival of exporting manufacturing in South Africa.

This study highlights the underexplored role of local and international networks in the survival of exporting manufacturing in South Africa.

Firm -Time and Firm-Product-Destination- Time levels

Contribute to the formulation of new policies to achieve the export growth target of 6% per annum set in the National Development Plan (NDP) Vision 2030.

Information asymmetry theory (Akerlof, 1970; Stiglitz, 1970; Spence, 1973)

Exporters are often lacking crucial information about the foreign market, consumer preferences, and the reliability of potential partners.

The challenge is to find matches between sellers (exporters) and foreign buyers (importers).

How do firms deal with this challenge of information asymmetry?

Social capital theory (Bourdieu, 1986; Coleman, 1988; Putnam, 1995, Rauch, 2001)

- ❖ **Local network:** access to trusted contacts and verifiable information.
- ❖ **International network:** access to reliable foreign partners, market information, and institutional knowledge.
- ❖ **GVC:** repeated relationships between firms, knowledge transfer.

Innovation diffusion theory (Rogers, 1962)

- ❖ Access to technology: diffusion of knowledge
- ❖ Adoption of advanced production methods:
 - Meet international standards and certifications
 - Serves as credible signals to foreign buyers about a product's quality.

This reduces the buyer's uncertainty and builds trust, ultimately increasing the likelihood of longer-term export relationships.

IV. Data and methodological approach

(10/21)

This research utilises multiple sources of data to conduct the analysis. Given our focus on exporter dynamics, we utilise :

- The customs transaction-level export data (National Treasury and UNU-WIDER, 2022a) as our main source of data covering the 2010-2021 period.
- This is supplemented by the customs transaction-level import data (National Treasury and UNU-WIDER, 2022a) as well as the CIT-IRP5 firm-level panel (National Treasury and UNU-WIDER, 2022b) for the same period.
- We merged these databases using a common firm identifier

IV. Data and Methodological approach

(11/21)

South Africa

	2011	2015	2020
Number of exporters	8,538	10,275	9,340
Start rate (%)	5.2	3.5	3.0
Survival rate (%)	74.7	62.0	50.5
Stopper rate (%)	1.9	2.6	5.6

Table 2: Exporter characteristics for South Africa.

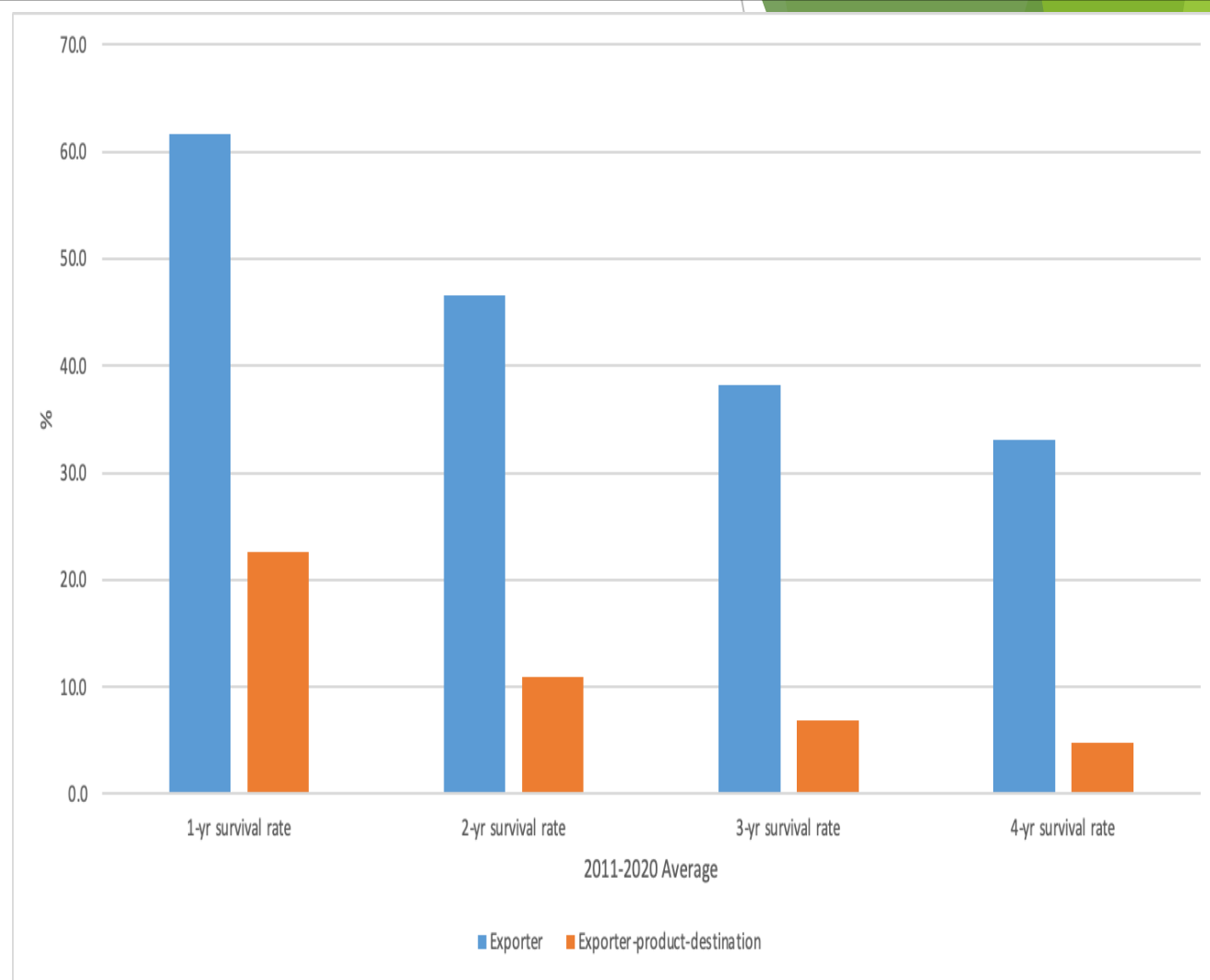


Figure 1: South African Exporter Survival, 2011-2020

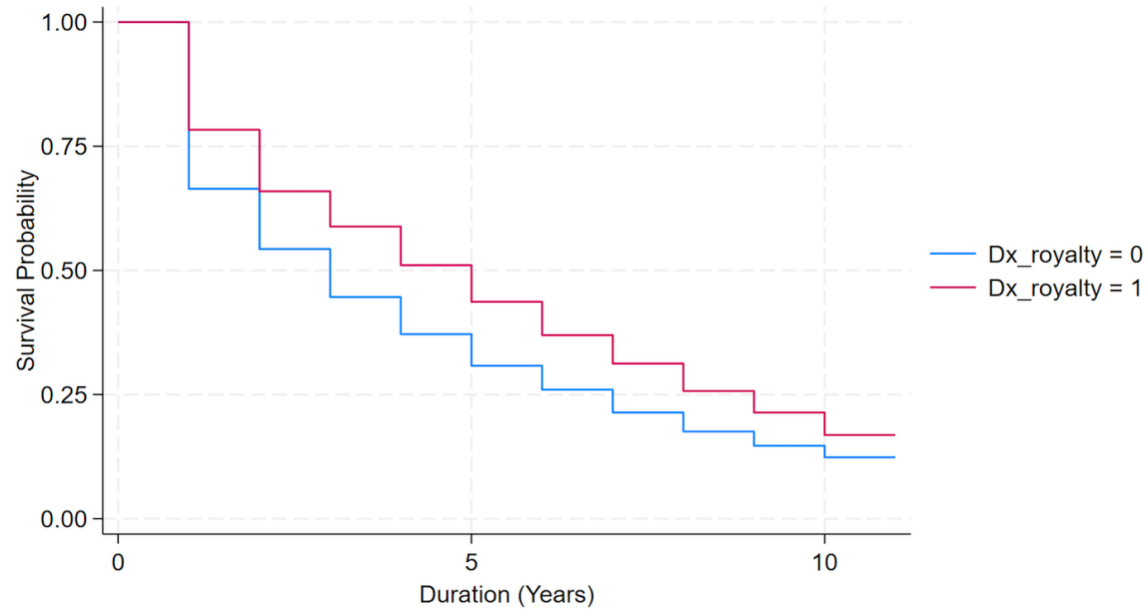


Figure 4: Royalty Expenditure Kaplan-Meier Plot

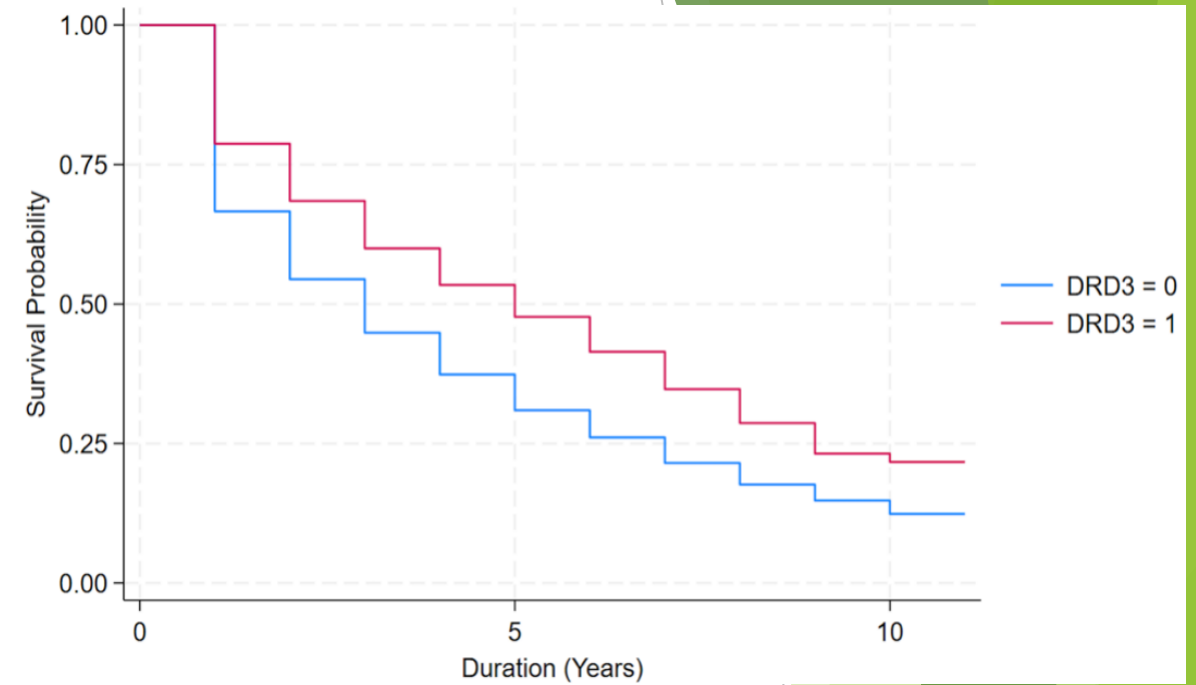
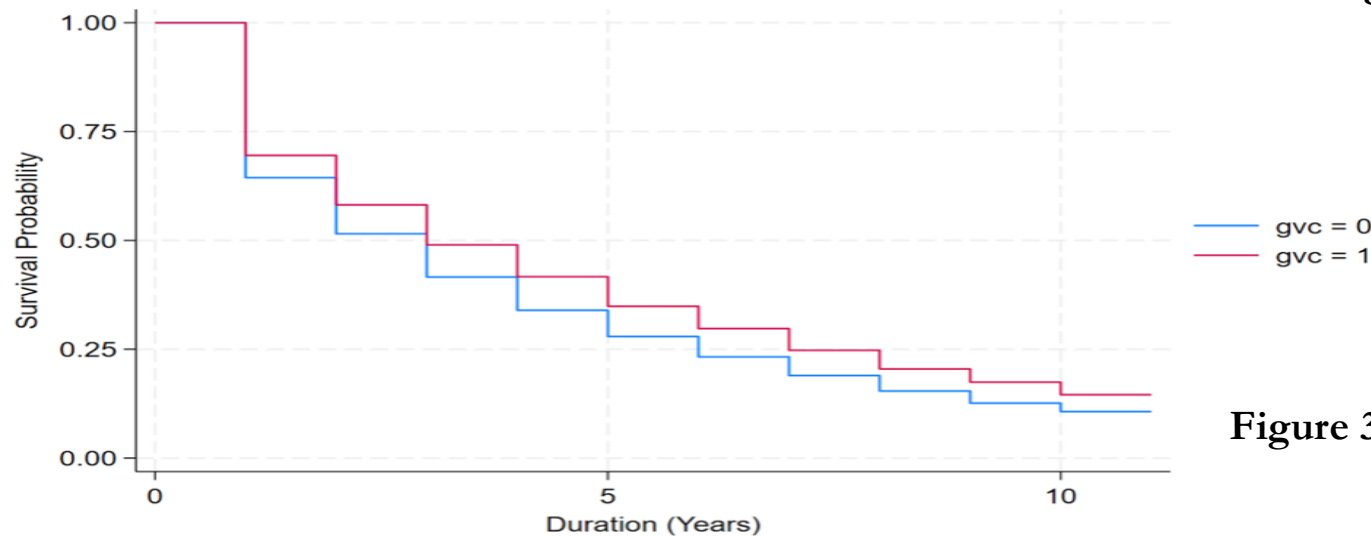


Figure 5: Research and Design (R&D) Expenditure



**Figure 3 :Global Value Chain (GVC) Firm
Kaplan-Meier Plot**

IV. Data and Methodological approach

Econometric model

Based on the models developed by Roner and Tomasi (2024), Hess & Persson(2012); Türkcan et al., (2022); we specify the following model:

$$h(t, X_i(t)|\vartheta) = h_0(t, \alpha) \exp (X_i(t)\beta + \delta d_i)\vartheta \quad (1)$$

– $h(t, X_i(t)|\vartheta)$ is the probability of export spell's failure at time t conditional on survival up to time t

– d_i denotes the potentially endogenous switching variable.

– $h_0(t, \alpha)$ denotes the baseline hazard function that can vary between intervals.

– ϑ is a strictly positive random variable that is independent of the covariates.

$X_i(t)$: firm covariates such as:

- Information network (Local and International network)

- ❖ The local firm-destination networks (lnn_fdt_doffice)
- ❖ The local firm-product networks (lnn_fpt_doffice)
- ❖ The firm-product-destination networks (lnn_fpdt)
- ❖ Local firm-product-destination networks (lnn_fpdt_doffice).
- ❖ GVC: firm that both imports foreign intermediate goods and exports its final products.

- Foreign technology :

- ❖ Royalties and license fees- debit amounts, expense items (Dx_royalty)
- ❖ Research & Development (DRD3)

IV. Data and methodological approach

(15/21)

The PCE assumes/ takes:

The Piecewise approximation model: consists to divide the study period into a finite number of distinct time intervals or pieces.

The Hazard function: within each interval, the hazard rate is assumed to be constant and can vary from an interval to another.

flexible model than fully parametric models that assume a single, global functional form for the elasticity across the entire range of the data.

a model that can be re-expressed as a poisson regression model, which allow for convenient estimation contrary to the cox model which doesn't assume a particular mathematical distribution.

The adjusted PCE model takes into account unobserved heterogeneity (or frailty).

Addressing the endogeneity issue

- ✓ Firm's multinational status, its expenditure on R&D, and payments for royalties are likely endogenous, as they may respond to unobserved factors affecting export longevity.
- ✓ The instruments are constructed as the share of all firms (excluding the own firm) in a 3-digit sector (according to SIC Revision 5) within a province that are part of an MNE ($Dmne_{iv_sh}$), report R&D expenditures ($DRD3_{iv_sh}$), or report royalty or licence expenditures ($x_{royalty_iv_sh}$).
- ✓ Sector province shares capture localized technological and network spillovers shaping a firm's status.
- ✓ Estimation technique: the 2SRI approach, where the residual of the first stage regression of y on an instrument and other controls, is included in the second stage (Terza et al., 2008).

V. RESULTATS (firm time level)

Table 5: Effects of foreign technology and networks on firm survival (PCE with 2SRI)

Variables	1 PCE extend	2 with FE	3 DRD	4 First stage Royalty logit	5 DMne	6 DRD	7 IV Royalty	8 DMNE	9 ALL logit
lnva_l	0.960** (0.008)	0.956** (0.009)	-0.001 (0.031)	0.114** (0.024)	0.467** (0.029)	0.959** (0.008)	0.958** (0.008)	0.957** (0.008)	0.957** (0.008)
lnx_v	0.957** (0.004)	0.956** (0.004)	0.077** (0.016)	0.025* (0.012)	0.029* (0.014)	0.959** (0.004)	0.958** (0.004)	0.959** (0.004)	0.958** (0.004)
Dmne	1.173** (0.061)	1.162** (0.062)	0.028 (0.144)	1.381** (0.090)		1.171** (0.061)	1.134* (0.062)	1.388** (0.159)	1.314* (0.156)
DRD3	0.833* (0.062)	0.869+ (0.067)		1.717** (0.088)	0.038 (0.151)	0.899 (0.191)	0.814* (0.066)	0.850* (0.066)	0.795 (0.176)
Dx_royalty	0.882* (0.045)	0.903+ (0.048)	1.773** (0.088)		1.412** (0.092)	0.889* (0.048)	1.232 (0.207)	0.880* (0.047)	1.177 (0.208)
gvc	1.007 (0.030)	1.036 (0.032)	-0.011 (0.108)	-0.133 (0.084)	0.535** (0.117)	1.017 (0.031)	1.018 (0.031)	1.020 (0.031)	1.021 (0.031)
lnvariety_m	0.929** (0.014)	0.915** (0.014)	0.212** (0.042)	0.181** (0.033)	0.508** (0.033)	0.926** (0.014)	0.925** (0.014)	0.922** (0.014)	0.922** (0.014)
lnn_fpdtd	0.985 (0.011)	0.987 (0.011)	-0.058 (0.046)	-0.068+ (0.037)	0.188** (0.039)	0.988 (0.011)	0.989 (0.011)	0.988 (0.011)	0.989 (0.011)
lnn_fpdtd_office_ft	0.965** (0.011)	0.964** (0.011)	-0.074 (0.046)	0.047 (0.036)	-0.293** (0.039)	0.964** (0.011)	0.963** (0.011)	0.965** (0.011)	0.964** (0.011)
lnn_prodf	0.876** (0.011)	0.863** (0.011)	-0.298** (0.042)	0.047 (0.030)	-0.217** (0.039)	0.872** (0.011)	0.872** (0.011)	0.873** (0.011)	0.872** (0.011)
lnn_destft	0.691** (0.017)	0.691** (0.017)	0.492** (0.060)	0.129** (0.048)	0.739** (0.055)	0.681** (0.017)	0.680** (0.017)	0.679** (0.017)	0.679** (0.017)
n_prior_spell	0.797** (0.016)	0.789** (0.016)	-0.096 (0.099)	-0.303** (0.079)	-0.085 (0.076)	0.797** (0.016)	0.799** (0.016)	0.798** (0.016)	0.799** (0.016)
cum_expyr	1.029**	1.028**	0.031	0.098**	0.021	1.028**	1.027**	1.028**	1.028**

V. RESULTATS (Firm-product- destination- level)

Table 9: Drivers of firm survival: PCE with Two-Stage Residual Inclusion Technique

Variables	Robust 1	2	IV Regression		5
	PCE extended	IV DRD logit	IV Royalty logit	IV Dmne	IV resid all logit
lnva_l	0.986** (0.005)	0.985** (0.005)	0.987* (0.006)	0.985** (0.005)	0.987* (0.006)
lnx_v	0.978** (0.001)	0.978** (0.001)	0.978** (0.001)	0.978** (0.001)	0.978** (0.001)
Dmne	1.006 (0.018)	1.005 (0.019)	1.025+ (0.014)	0.990 (0.029)	1.018 (0.023)
DRD3	0.998 (0.015)	0.995 (0.016)	1.004 (0.017)	0.995 (0.016)	1.005 (0.018)
Dx_royalty	0.951** (0.016)	0.958* (0.017)	0.867* (0.056)	0.960* (0.016)	0.868* (0.055)
lnn_fpd	0.977** (0.006)	0.975** (0.006)	0.976** (0.006)	0.975** (0.006)	0.976** (0.006)
lnn_fpd_doffice	0.995 (0.007)	0.997 (0.007)	0.995 (0.007)	0.997 (0.007)	0.995 (0.007)
gvc	1.047** (0.017)	1.050** (0.018)	1.051** (0.017)	1.047** (0.018)	1.049** (0.018)
lnvariety_m	0.976** (0.006)	0.976** (0.006)	0.977** (0.006)	0.978** (0.007)	0.978** (0.007)
core_mkt	0.934** (0.010)	0.935** (0.010)	0.926** (0.010)	0.934** (0.010)	0.926** (0.010)
core_prod	0.730** (0.012)	0.729** (0.013)	0.729** (0.013)	0.729** (0.013)	0.729** (0.013)
lncum_trans	0.456** (0.003)	0.456** (0.003)	0.456** (0.004)	0.456** (0.003)	0.456** (0.004)
Indist	1.009* (0.004)	1.006 (0.004)	1.007 (0.004)	1.006 (0.004)	1.007 (0.004)

V. Conclusion

At the firm-time level:

- ❖ Local networks reduce hazard risk by lowering information frictions and building trust, thereby improving firm stability more quickly.
- ❖ Exporters investing in royalties and R&D achieve higher survival rates.

At the firm-Product-Destination-time level:

- ❖ Royalty expenditures and international networks lower hazard risk by enhancing competitiveness, providing superior technologies, and increasing product appeal that reduces uncertainty.

V. Recommendations

- ❖ South African manufacturing firms should actively build partnerships with local suppliers and foreign buyers, and engage in industry networks and trade fairs to enhance information flows and reduce uncertainty.
- ❖ Manufacturing firms should increase investment in innovation by allocating resources to R&D and acquiring strategic technologies through royalties.
- ❖ Firms should reduce reliance on a single market by expanding into new export destinations and diversifying product offerings.
- ❖ Government should support cluster development and industrial hubs to strengthen local supplier linkages, and provide R&D tax incentives and innovation grants to lower technological upgrading costs.

Exporting is a risky and dynamic process. It is a world of “creative destruction” where firms constantly enter and exit markets.

THANK YOU !!!