Influential Article Review - Understanding How Trade Coordination Affects Innovation

Phyllis Cohen

Mack Briggs

This paper examines technological innovation. We present insights from a highly influential paper. Here are the highlights from this paper: Based on the theory of technology spillover in international trade, this paper discusses the technological innovation effect of trade by taking the influence of domestic trade into account. Under the constraint of the production possibility frontier, there is either complementarity or substitutability between domestic and foreign trade. It must be decided whether resources should be concentrated in one of the sectors (trade specialization) or instead allocated equally (trade equalization) between the two sectors. This paper firstly discusses how domestic trade and foreign trade work together to influence technological innovation, and how trade equalization and specialization affect different types of innovation. Using a provincial-level panel dataset from 2007 to 2015 in China, this paper constructs the indicators of domestic and foreign trade linkage and examines the impact of trade on innovation. The findings show that trade equalization mainly promotes incremental innovation, while trade specialization improves radical innovation. Thus, in the area of incremental innovation, attention should be paid to the equalized development of domestic and foreign trade, while in areas pursuing radical innovation, emphasis should be put on the specialization of the trade sector, avoiding equal allocation of resources to the two sectors. For our overseas readers, we then present the insights from this paper in Spanish, French, Portuguese, and German.

Keywords: Domestic and foreign trade coordination, Technological innovation effect, Radical innovation, Incremental innovation

SUMMARY

- Based on the total retail sales of consumer goods and the total amount of import and export, this paper constructs proxy variables that reflect the equalization and specialization of trade. Although both trade equalization and trade specialization benefit innovation, only one of them has priority for resources to be allocated since resources are limited. The results support the hypothesis that trade equalization strengthens incremental innovation more effectively while trade specialization is more beneficial to radical innovation. The coefficients of control variables in mean-value regression are consistent with the economic intuition. Though the coefficients differ at different quantiles in quantile regression, the results are still consistent with previous work which implies the nonlinear relationship between control variables and innovation.

- For a region where economic growth is driven by the diffusion effect of the core industry , imitation and incremental innovation are more important. So attention should be paid to the equalized development of domestic and foreign trade. Resources should be allocated to the weaker sector and the over-persuasion for specialization of a trade sector should be avoided. The government can promote equalization of trade by means of tax preferences, supporting relevant infrastructure construction, etc. For example, if domestic trade is relatively less developed, the policy makers of the region can invest fiscal funds into constructing logistics facilities and giving preferential tolls for roads or bridges.
- This paper discussed the effect that trade has on technological innovation, especially from the perspective of the interaction between domestic and foreign trade. Foreign trade affects innovation from technology spillover such as imitation, competition, upstream and downstream links. The findings presented in this paper show that the coordinated development of domestic and foreign trade leads to effects on innovation mainly through the information diffusion effect, competition driving effect and value chain optimization effect. This will strengthen technology spillover, and thereby enhance technology innovation. Moreover, the coordinated development of domestic and foreign trade is classified into trade equalization and trade specialization. Trade equalization mainly promotes incremental developments, while trade specialization improves radical innovation. It is worth noting that although this paper divides technological innovation into two types , it does not mean that the former is more beneficial to regional economic development than the other. Since the economic development stage and the industrial structure differ in different regions, radical innovation may fit the development needs of certain areas but be counterproductive in other areas where incremental innovation is more in line with the actual situation, and then promote the economic development in these areas.

HIGHLY INFLUENTIAL ARTICLE

We used the following article as a basis of our evaluation:

Xie, L., Wang, S., & Wang, X. (2017). The effect of domestic and foreign trade coordination on technological innovation: Complements or substitutes? Frontiers of Business Research in China, 11(1), 1–21.

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INTRODUCTION

In Solow's economic growth model, when a country's capital-labor input reaches a stable state, the technical level is the driving force leading to further economic growth, and technological innovation is an important source of technological progress. Great emphasis has always been placed on trade among the numerous and complicated factors affecting technological innovation. The relevant studies mainly focus on the technological innovation effect from the perspective of international trade, however, and rarely consider the linkage effect of domestic trade.

The main conclusions of the existing literature focusing on international trade note that the technological innovation effect of trade can simultaneously influence both importers and exporters. International trade can either improve the technological level of the production activities in the importing country through high-quality intermediate products (Tradee and Helpman, 1993; Grossman and Helpman, 1991), or improve the technological level of the exporting country by means of Original Equipment Manufacturer as well as processing trade. Some studies argue that the positive impact of foreign trade on technological innovation is confined to developed countries (Coe and Helpman, 1995). They propose that developing countries likely lose the technological innovation capacity of their local firms in foreign trade

due to low-end lock in the value chain and excessive reliance on international markets (Stokey, 1991; Young, 1991). Due to differences related to economic development and industrial competition, the actual effect of trade on technology innovation is changing. This paper argues that the coordination between domestic and foreign trade reflects the complexity of trade in a country's market (especially in large markets). Recent empirical literature also points to the close relationship between domestic and foreign trade. Domestic trade can promote adjustments to the export propensity by strengthening supply-demand matching and reducing market fragmentation and transaction costs (Zhang, 2014). In addition, domestic trade may also enhance the technical spillover effect of foreign trade and may lead to additional technology spillover effects via the tight connections between the two trading sectors.

In addition to the refinement of trade indicators, the core issue is to further identify how to make trade arrangements so that they have a positive impact, while avoiding the negative effects of trade on technological innovation. It is important to consider equalization and specialization between domestic and foreign trade when the coordination of these factors is included in research on the technological spillover effect. Regardless of the economic integration among different countries, there have always been professional activities in domestic and foreign trade sectors since they follow different paradigms and are subject to different trading rules. Under the constraint of the production possibility frontier, it must be decided how the resources are allocated between the two major trade sectors. The resources can be concentrated in one of the sectors, referred to as specialization (or trade specialization) in this paper. The resources can instead be allocated equally between the two sectors, referred to as equalization (or trade equalization). Therefore, the two major trade sectors (domestic and foreign) should coordinate and interconnect. The various effects of equalization and specialization of the two sectors also need to be considered. Based on the theory of technology spillover in international trade, this paper discusses the technological innovation effect of trade by taking the influence of domestic trade into account and constructing the indicators of domestic and foreign trade linkage.

The contribution of the paper lies in the following aspects: First, previous research has primarily focused on the relationship between international trade and technological innovation, while ignoring the impact of domestic trade. This paper, by measuring the level of coordinated development between domestic and foreign trade, more comprehensively examines the impact of trade on technological innovation. Second, under the condition of resource constraint, there is either complementarity (trade equalization) or substitutability (trade specialization) between domestic and foreign trade in the development of the two sectors. Having considered theories of technology spillover as well as equalization and specialization of the two trading sectors, this paper analyzes the mechanism of how coordinated development of trade affects technological innovation. Thirdly, some studies classify innovation into radical innovation and incremental innovation (March, 1991). This paper analyzes the impact of trade equalization and specialization on different types of innovation.

The article is structured as follows: Section 2, focusing on the perspective of technology spillover, discusses how the coordinated development of domestic trade and international trade work together to influence technological innovation, and how trade equalization and specialization affect different types of innovation. Section 3 constructs the index of trade coordination and describes empirical tests using the fixed-effect model, the panel quantile model and so on. Section 4 discusses the conclusions and implications for future research.

CONCLUSION

This paper discussed the effect that trade has on technological innovation, especially from the perspective of the interaction between domestic and foreign trade. Foreign trade affects innovation from technology spillover such as imitation, competition, upstream and downstream links. The findings presented in this paper show that the coordinated development of domestic and foreign trade leads to effects on innovation mainly through the information diffusion effect, competition driving effect and value chain optimization effect. This will strengthen technology spillover, and thereby enhance technology innovation. Moreover, the coordinated development of domestic and foreign trade is classified into trade equalization

and trade specialization. Trade equalization mainly promotes incremental developments, while trade specialization improves radical innovation. It is worth noting that although this paper divides technological innovation into two types (radical and incremental), it does not mean that the former is more beneficial to regional economic development than the other. Since the economic development stage and the industrial structure differ in different regions, radical innovation may fit the development needs of certain areas but be counterproductive in other areas where incremental innovation is more in line with the actual situation, and then promote the economic development in these areas.

This paper constructs proxy variables that reflect the equalization and specialization of trade. The number of patent applications is set as the dependent variable, combined with the fixed effect panel model and fixed effect panel quantile model. The paper examines the role that trade equalization or trade specialization plays in regard to different types of technological innovation. The empirical results support the theoretical predictions.

In this paper, we develop a construct named trade coordination which can be well estimated and evaluated by the empirical methods we give above. Further studies include exploring the relationship between trade coordination and other variables such as investment propensity or total factor productivity. The study of antecedent variables is also important for specific policies to improve trade coordination.

APPENDIX

FIGURE 1
THE EFFECT OF COORDINATED DEVELOPMENT OF TRADE ON TYPES OF INNOVATION

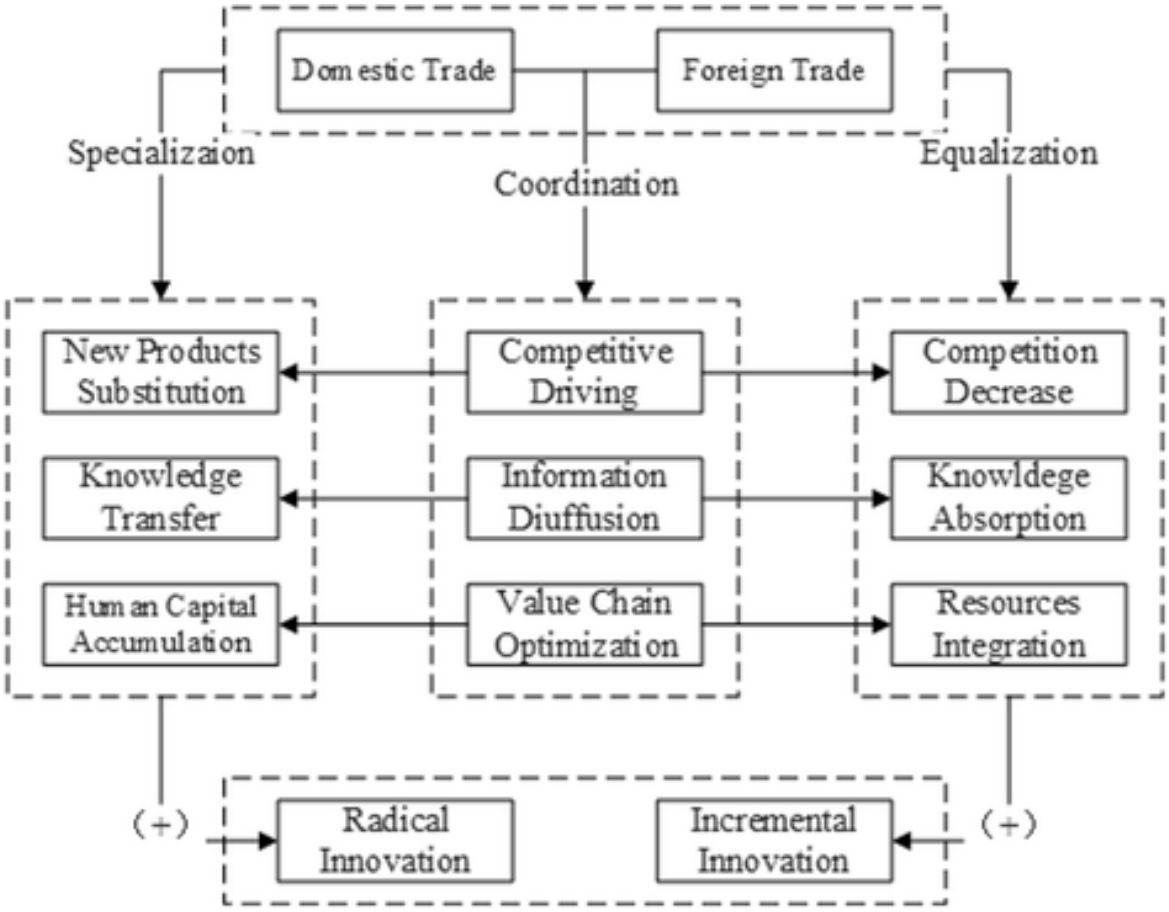

TABLE 1
STATES OF TRADE COORDINATION

State I: Coordination-equalization	State II: Coordination-specialization	State III: Relatively low degree of coordination
Developed domestic trade as well as foreign trade	Developed domestic trade and underdeveloped foreign trade, or developed foreign trade and underdeveloped domestic trade	Underdeveloped domestic trade and foreign trade

TABLE 2
DEPENDENT AND INDEPENDENT VARIABLES

Variable	Label	Calculation Method
Patent	Total Patents	Number of Patents Accepted, Domestic (Item)
Invention	Invention Patents	Number of Invention Patents Accepted, Domestic (Item)
Utility	Patents for Utility Models	Number of Patents for Utility Models Accepted, Domestic (Item)
Design	Patents for Designs	Number of Patents for Designs Accepted, Domestic (Item)
Trade	Trade Coordination	Calculation by the Equation Mentioned above
Trade [1]	Trade Coordination	Calculation by the Equation Mentioned above
PGDP	Economy Development	Gross Regional Product (100 Million Yuan)/ Resident Population (Year-end) (10,000 Persons)
Profit	Trade Development	Profits from Principal Business of Enterprises above Designated Size of Wholesale and Retail Trade (100 Million Yuan)
FDI	Foreign Direct Investment	Registered Capital of Foreign Funded Enterprises/ Gross Regional Product
Govern	Government Expenditure	Local Governments General Budgetary Expenditure/ Gross Regional Product

TABLE 3
DESCRIPTIVE STATISTICS

Variable	*Observations*	*Mean*	*Standard Error*	*Min*	*Max*
Patent	310	45,205	75,454	89	504,500
Invention	310	13,873	22,914	21	154,608

Utility	310	17,291	26,076	21	154,281
Design	310	14,041	31,799	28	255,474
Trade	310	9746	309.2	8167	9999
Trade1	310	572.8	620.2	13.21	2772
PGDP	310	3.61	2.12	0.634	10.69
Profit	310	7695	10,751	15.30	60,415
FDI	310	0.244	0.186	0.084	1.346
Govern	310	5.424	7.478	0.764	75.03

Data Source: NBS (National Bureau of Statistics of the People's Republic of China), http://www.stats.gov.cn/

TABLE 4
THE MEAN VALUE OF VARIABLES IN DIFFERENT INTERVALS OF INVENTION PATENTS

	80–90	**70–80**	**60–70**	**50–60**	**50–40**	**40–30**	**30–20**	**10–20**	**1–10**
Trade	28.7	23.0	18.5	21.3	18.4	14.8	15.0	10.9	9.8
R	2.7	5.1	12.4	13.7	15.2	12.5	20.4	22.2	22.7
E	4.5	5.6	11.9	13.9	16.2	13.7	19.3	25.6	22.4
Trade [1]	3.0	4.7	12.1	12.7	14.4	12.6	20.1	22.5	24.4

Data Source: NBS (National Bureau of Statistic of the People's Republic of China), http://www.stats.gov.cn/

TABLE 5
THE MEAN VALUE OF VARIABLES IN DIFFERENT INTERVALS OF PATENTS FOR UTILITY MODELS AND PATENTS FOR DESIGN

	80–90	**70–80**	**60–70**	**50–60**	**50–40**	**40–30**	**30–20**	**10–20**	**1–10**
Trade	25.3	24.4	22.3	16.7	18.7	17.9	13.6	10.6	11.9
R	2.6	7.7	9.5	9.6	17.7	14.3	20.2	21.6	23.5
E	5.0	10.6	9.7	10.0	15.2	15.0	20.7	26.0	19.6
Trade [1]	2.2	7.2	9.5	10.1	15.5	14.8	20.2	22.9	23.7

Data Source: NBS (National Bureau of Statistic of the People's Republic of China), http://www.stats.gov.cn/

TABLE 6
THE IMPACT OF TRADE COORDINATION: BENCHMARK REGRESSION

	1-Patent	***2-Invention***	***3-Utility + Design***
PGDP	12546***	5446***	7100***
	(2224)	(1612)	(738.9)
Profit	3.372***	1.077***	2.295***
	(0.416)	(0.156)	(0.266)
FDI	188.0*	154.1*	33.83
	(95.51)	(81.74)	(54.63)
Govern	−73380***	−32359**	−41021***
	(14450)	(11185)	(5088)
C	−9124**	−7005**	−2120
	(2920)	(2337)	(1311)
Individual Fixed	Yes	Yes	Yes
Driscoll–Kraay SE	Yes	Yes	Yes
Within R^2	0.5582	0.5782	0.4815
F–Test	223.1***	461.5***	193.7***
Hausman Test	11.53***	21.62***	7.06*
Modified Wald Test	2.0E + 4***	5.1E + 4***	4.2E + 4***
Pesaran Test	11.93***	12.49***	9.12***

Standard Error appears in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01
Hausman Test H0: Random Effects Model is valid
Modified Wald Test H0: The variances are identical
Pesaran Test H0: There is no cross-sectional dependence

TABLE 7
THE IMPACT OF TRADE COORDINATION: FIXED EFFECTS MODEL

	1-Patent	***2-Invention***	***3-Utility + Design***
Trade	257.9***	85.12***	172.8***
	(35.66)	(19.71)	(29.22)
PGDP	11906***	5274***	6632***

	(1600)	(1378)	(721.7)
Profit	2.616***	0.826***	1.790***
	(0.354)	(0.176)	(0.213)
FDI	354.3***	194.9**	159.4
	(84.04)	(78.08)	(87.39)
Govern	−64673***	−30702***	−33971***
	(8390)	(8533)	(6035)
C	−2.5E + 6***	−8.3E + 5***	−6.6e + 5***
	(347247)	(192594)	(80249)
Time Control Variable	*Control*	*Control*	*Control*
Individual Fixed	Yes	Yes	Yes
Driscoll-Kraay SE	Yes	Yes	Yes
Within R^2	0.6215	0.6309	0.5461
F-Test	67.24***	340.7***	22.02***
Hausman Test	24.17**	132.2***	16.39[a]
Modified Wald Test	6.5E + 4***	2.7E + 4***	4.1E + 4***
Pesaran Test	6.97***	9.94***	4.65***

Standard Error appears in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01. The H0 of the tests are the same as in Table 6

[a]Although the Hausman test does not refuse the H0, we still use the fixed effect to control the individual heterogenicity

TABLE 8
THE IMPACT OF TRADE COORDINATION: FIXED EFFECT PANEL QUANTILE (RADICAL INNOVATION)

	1–20% Invention	***2–40% Invention***	***3–60% Invention***	***4–80% Invention***
Trade [1]	5.946***	5.902***	4.760***	5.606
	(1.032)	(1.752)	(2.737)	(7.144)
PGDP	220.8	70.03	665.6	1287*
	(157.3)	(276.0)	(419.3)	(735.9)
Profit	0.762***	1.093***	1.189***	1.728***
	(0.105)	(0.150)	(0.162)	(0.355)

FDI	−159.3	−219.6	−124.8	−5.062
	(144.6)	(189.9)	(194.2)	(153.3)
Govern	227.4	279.9	−718.0	−197.0
	(843.1)	(561.1)	(851.4)	(2266)
C	−3543***	−2655***	−3210***	−4155*
	(847.1)	(906.8)	(1126)	(2586)
Time Control Variable	*Control*	*Control*	*Control*	*Control*
Individual Fixed	Yes	Yes	Yes	Yes

Standard Error appears in parentheses adjusted by 1000 times Bootstrap. *p < 0.10, **p < 0.05, ***p < 0.01
The score of Lambda is the default 1

TABLE 9
THE IMPACT OF TRADE COORDINATION: FIXED EFFECT PANEL QUANTILE (INCREMENTAL INNOVATION)

	1–20% Utility + Design	***2–40% Utility + Design***	***3–60% Utility + Design***	***4–80% Utility + Design***
Trade [1]	27.15***	34.81***	42.49***	48.34***
	(4.794)	(8.390)	(11.47)	(22.08)
PGDP	1197***	1208*	226.2	262.2
	(400.6)	(733.1)	(749.6)	(883.6)
Profit	0.404**	0.660	1.616*	3.327*
	(0.171)	(0.601)	(0.833)	(1.772)
FDI	—291.5	−368.6	−27.25	22.67
	(418.0)	(617.7)	(448.5)	(217.9)
Govern	−5626	−72.93	3244*	5799
	(4332)	(2230)	(1932)	6307
C	−11651***	−12372***	−13874***	−16447***
	(3253)	(3677)	(3647)	(5059)
Time Control Variable	*Control*	*Control*	*Control*	*Control*
Individual Fixed	Yes	Yes	Yes	Yes

Standard Error appears in parentheses adjusted by 1000 times Bootstrap. *p < 0.10, **p < 0.05, ***p < 0.01
The score of Lambda is the default 1

TABLE 10
ROBUSTNESS TEST: ALTERNATIVE DEPENDENT VARIABLES

	1–Patent	***2–Invention***	***3–Utility + Design***
Trade	129.5***	12.42***	117.1***
	(18.25)	(3.41)	(21.29)
PGDP	6314***	922.4*	5391***
	(1117)	(466.7)	(768.2)
Profit	1.859***	0.306***	1.552***
	(0.254)	(0.0726)	(0.193)
FDI	195.6***	51.82	143.8**
	(56.30)	(34.99)	(57.98)
Govern	−33408***	−4479*	−28929***
	(4871)	(2093)	(4165)
C	−1.3E + 6***	−1.2E + 5***	−1.1E + 6***
	(177241)	(33708)	(207164)
Time Control Variable	*Control*	*Control*	*Control*
Individual Fixed	Yes	Yes	Yes
Driscoll-Kraay SE	Yes	Yes	Yes

Standard Error appears in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01. The tests are the same as in Table 6

TABLE 11
ROBUSTNESS TEST: DISCRETIZATION OF INDEPENDENT VARIABLES

	1–Patent	***2–Invention***	***3–Utility + Design***
Trade	53040**	15712***	37328**
	(19456)	(4795)	(16013)
PGDP	12526***	5497***	7029***
	(2077)	(1589)	(835.7)
Profit	3.106***	0.989***	2.116***

	(0.473)	(0.194)	(0.291)
FDI	335.7***	189.8**	145.9
	(87.52)	(79.04)	(91.68)
Govern	−64342***	−30805**	−33537***
	(12109)	(10112)	(5340)
C	−2.1E + 5**	−65841***	−1.5E + 5**
	(73640)	(17662)	(61989)
Time Control Variable	*Control*	*Control*	*Control*
Individual Fixed	Yes	Yes	Yes
Driscoll-Kraay SE	Yes	Yes	Yes

Standard Error appears in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01. The tests are the same as in Table 6

TABLE 12
ROBUSTNESS TEST: THE LAG OF INNOVATION

	1–Patent	***2–Invention***	***3–Utility + Design***
Trade	250.6***	65.90**	184.7***
	(47.82)	(21.44)	(34.86)
L1.Trade	8.483	20.59	−12.11
	(58.51)	(17.63)	(43.12)
L2.Trade	−4.733	−19.43	14.70
	(57.54)	(17.10)	(42.70)
PGDP	12680***	5131***	7548***
	(1843)	(1448)	(748.9)
Profit	2.287***	0.788***	1.499***
	(0.565)	(0.239)	(0.334)
FDI	243.3	100.8**	142.5
	(155.8)	(41.20)	(133.6)
Govern	−59123***	−26690**	−32434***
	(12772)	(9686)	(6809)

C	−2.5E + 6***	−6.6E + 5**	−1.8E + 6***
	(474479)	(210315)	(344315)
Time Control Variable	*Control*	*Control*	*Control*
Individual Fixed	Yes	Yes	Yes
Driscoll-Kraay SE	Yes	Yes	Yes

Standard Error appears in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01. The tests are the same as in Table 6

TABLE 13
ROBUSTNESS TEST: CHANGE THE INDICATOR OF TRADE COORDINATION (DEPENDENT VARIABLE: RADICAL INNOVATION)

	1–20% invention	***2–40% invention***	***3–60% invention***	***4–80% invention***
Trade ^{2}	77.24***	69.30***	56.13	11.88
	(15.15)	(26.04)	(60.76)	(189.8)
Control Variable	*Control*	*Control*	*Control*	*Control*
Time Control Variable	*Control*	*Control*	*Control*	*Control*
Individual Fixed	Yes	Yes	Yes	Yes

Standard Error appears in parentheses adjusted by 1000 times Bootstrap. *p < 0.10, **p < 0.05, ***p < 0.01
The score of Lambda is the default 1

TABLE 14
ROBUSTNESS TEST: CHANGE THE INDICATOR OF TRADE COORDINATION (DEPENDENT VARIABLE: INCREMENTAL INNOVATION)

	1–20% Practical + Design	***2–40% Practical + Design***	***3–60% Practical + Design***	***4–80% Practical + Design***
Trade ^{2}	325.8***	544.6***	625.6***	587.5
	(81.08)	(158.4)	(233.2)	(456.3)
Control Variable	*Control*	*Control*	*Control*	*Control*
Time Control Variable	*Control*	*Control*	*Control*	*Control*
Individual Fixed	Yes	Yes	Yes	Yes

Standard Error appears in parentheses adjusted by 1000 times Bootstrap. *p < 0.10, **p < 0.05, ***p < 0.01
The score of Lambda is the default 1

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TRANSLATED VERSION: SPANISH

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VERSION TRADUCIDA: ESPAÑOL

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INTRODUCCIÓN

En el modelo de crecimiento económico de Solow, cuando el insumo de capital-trabajo de un país alcanza un estado estable, el nivel técnico es la fuerza motriz que conduce a un mayor crecimiento económico, y la innovación tecnológica es una fuente importante de progreso tecnológico. Siempre se ha hecho mucho hincapié en el comercio entre los numerosos y complicados factores que afectan a la innovación tecnológica. Sin embargo, los estudios pertinentes se centran principalmente en el efecto de la innovación tecnológica desde la perspectiva del comercio internacional, y rara vez consideran el efecto de vinculación del comercio interno.

Las principales conclusiones de la literatura existente centrada en el comercio internacional señalan que el efecto de la innovación tecnológica del comercio puede influir simultáneamente tanto en los importadores como en los exportadores. El comercio internacional puede mejorar el nivel tecnológico de las actividades de producción en el país importador mediante productos intermedios de alta calidad (Tradee y Helpman, 1993; Grossman y Helpman, 1991), o mejorar el nivel tecnológico del país exportador por medio del fabricante de equipos originales, así como el comercio de procesamiento. Algunos estudios sostienen que el impacto positivo del comercio exterior en la innovación tecnológica se limita a los países desarrollados (Coe y Helpman, 1995). Proponen que los países en desarrollo probablemente pierdan la capacidad de innovación tecnológica de sus empresas locales en el comercio exterior debido a la esclusa de gama baja en la cadena de valor y la excesiva dependencia de los mercados internacionales (Stokey, 1991; Young, 1991). Debido a las diferencias relacionadas con el desarrollo económico y la competencia industrial, el efecto real del comercio en la innovación tecnológica está cambiando. Este documento

sostiene que la coordinación entre el comercio interno y el comercio exterior refleja la complejidad del comercio en el mercado de un país (especialmente en los grandes mercados). La literatura empírica reciente también señala la estrecha relación entre el comercio interno y el comercio exterior. El comercio interno puede promover ajustes en la propensión a la exportación mediante el fortalecimiento de la conciliación de la oferta-demanda y la reducción de la fragmentación del mercado y los costos de transacción (Zhang, 2014). Además, el comercio interno también puede aumentar el efecto de contagio técnico del comercio exterior y puede dar lugar a efectos adicionales de contagio de la tecnología a través de las estrechas conexiones entre los dos sectores comerciales.

Además del perfeccionamiento de los indicadores comerciales, la cuestión fundamental es determinar aún más cómo establecer acuerdos comerciales para que tengan un impacto positivo, evitando al mismo tiempo los efectos negativos del comercio en la innovación tecnológica. Es importante considerar la igualdad y la especialización entre el comercio nacional y el comercio exterior cuando la coordinación de estos factores se incluye en la investigación sobre el efecto de contagio tecnológico. Independientemente de la integración económica entre los diferentes países, siempre ha habido actividades profesionales en los sectores del comercio interno y exterior, ya que siguen diferentes paradigmas y están sujetos a diferentes normas comerciales. Bajo la limitación de la frontera de la posibilidad de producción, debe decidirse cómo se asignan los recursos entre los dos principales sectores comerciales. Los recursos pueden concentrarse en uno de los sectores, denominado especialización (o especialización comercial) en este documento. En su lugar, los recursos pueden asignarse por igual entre los dos sectores, denominados igualación (o igualación comercial). Por lo tanto, los dos principales sectores comerciales (nacionales y extranjeros) deberían coordinarse e interconectarse. También es necesario tener en cuenta los diversos efectos de la igualdad y la especialización de los dos sectores. Sobre la base de la teoría del contagio de la tecnología en el comercio internacional, este documento analiza el efecto de la innovación tecnológica del comercio teniendo en cuenta la influencia del comercio interno y construyendo los indicadores de la vinculación del comercio interno y exterior.

La contribución del documento radica en los siguientes aspectos: En primer lugar, investigaciones anteriores se han centrado principalmente en la relación entre el comercio internacional y la innovación tecnológica, ignorando al mismo tiempo el impacto del comercio interno. Este documento, al medir el nivel de desarrollo coordinado entre el comercio interno y el comercio exterior, examina de manera más exhaustiva el impacto del comercio en la innovación tecnológica. En segundo lugar, con la condición de restricción de recursos, existe complementariedad (ecualización comercial) o sustituibilidad (especialización comercial) entre el comercio interno y el comercio exterior en el desarrollo de los dos sectores. Habiendo examinado las teorías de la propagación tecnológica, así como la ecualización y especialización de los dos sectores comerciales, este documento analiza el mecanismo de cómo el desarrollo coordinado del comercio afecta la innovación tecnológica. En tercer lugar, algunos estudios clasifican la innovación en innovación radical e innovación incremental (marzo de 1991). Este documento analiza el impacto de la ecualización y especialización comercial en diferentes tipos de innovación.

El artículo se estructura de la siguiente manera: La Sección 2, centrada en la perspectiva de la investigación tecnológica, analiza cómo el desarrollo coordinado del comercio interno y el comercio internacional trabajan juntos para influir en la innovación tecnológica, y cómo la igualdad comercial y la especialización afectan a los diferentes tipos de innovación. La Sección 3 construye el índice de coordinación del comercio y describe las pruebas empíricas utilizando el modelo de efecto fijo, el modelo cuantitativo del panel, etc. En la sección 4 se analizan las conclusiones y las implicaciones para futuras investigaciones.

CONCLUSIÓN

En este documento se examinó el efecto que el comercio tiene en la innovación tecnológica, especialmente desde la perspectiva de la interacción entre el comercio interno y el exterior. El comercio exterior afecta a la innovación por la propagación de la tecnología, como la imitación, la competencia, los enlaces aguas arriba y los enlaces aguas abajo. Las conclusiones presentadas en este documento muestran

que el desarrollo coordinado del comercio nacional y exterior conduce a efectos sobre la innovación principalmente a través del efecto de difusión de la información, el efecto de impulsar la competencia y el efecto de optimización de la cadena de valor. Esto fortalecerá la propagación de la tecnología y, por lo tanto, mejorará la innovación tecnológica. Además, el desarrollo coordinado del comercio interno y exterior se clasifica en la igualdad comercial y la especialización comercial. La ecualización del comercio promueve principalmente la evolución incremental, mientras que la especialización comercial mejora la innovación radical. Vale la pena señalar que aunque este documento divide la innovación tecnológica en dos tipos (radical e incremental), no significa que el primero sea más beneficioso para el desarrollo económico regional que el otro. Dado que la etapa de desarrollo económico y la estructura industrial difieren en diferentes regiones, la innovación radical puede adaptarse a las necesidades de desarrollo de ciertas áreas, pero ser contraproducente en otras áreas donde la innovación incremental está más en línea con la situación real, y luego promover el desarrollo económico en estas áreas.

Este documento construye variables proxy que reflejan la ecualización y especialización del comercio. El número de solicitudes de patente se establece como la variable dependiente, combinada con el modelo de panel de efecto fijo y el modelo cuantitativo del panel de efecto fijo. En el documento se examina el papel que desempeña la igualdad comercial o la especialización comercial en relación con los diferentes tipos de innovación tecnológica. Los resultados empíricos apoyan las predicciones teóricas.

En este documento, desarrollamos una construcción llamada coordinación comercial que puede ser bien estimada y evaluada por los métodos empíricos que damos arriba. Otros estudios incluyen la exploración de la relación entre la coordinación comercial y otras variables, como la propensión a la inversión o la productividad total de los factores. El estudio de las variables antecedentes también es importante para políticas específicas para mejorar la coordinación del comercio. Ss

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INTRODUCTION

Dans le modèle de croissance économique de Solow, lorsque l'apport capital-main-d'œuvre d'un pays atteint un état stable, le niveau technique est le moteur de la poursuite de la croissance économique, et l'innovation technologique est une source importante de progrès technologiques. L'accent a toujours été mis sur le commerce entre les nombreux facteurs complexes qui influent sur l'innovation technologique. Toutefois, les études pertinentes portent principalement sur l'effet de l'innovation technologique du point de vue du commerce international et considèrent rarement l'effet de liaison du commerce intérieur.

Les principales conclusions de la littérature existante portant sur le commerce international notent que l'effet du commerce sur l'innovation technologique peut simultanément influencer à la fois les importateurs et les exportateurs. Le commerce international peut soit améliorer le niveau technologique des activités de production dans le pays importateur grâce à des produits intermédiaires de haute qualité (Tradee et Helpman, 1993; Grossman et Helpman, 1991), ou d'améliorer le niveau technologique du pays exportateur au moyen de fabricant d'équipement d'origine ainsi que le commerce de transformation. Certaines études soutiennent que l'impact positif du commerce extérieur sur l'innovation technologique se limite aux pays développés (Coe et Helpman, 1995). Ils proposent que les pays en développement perdent probablement la

capacité d'innovation technologique de leurs entreprises locales dans le commerce extérieur en raison du blocage bas de gamme de la chaîne de valeur et de la dépendance excessive à l'égard des marchés internationaux (Stokey, 1991; Young, 1991). En raison des différences liées au développement économique et à la concurrence industrielle, l'effet réel du commerce sur l'innovation technologique est en train de changer. Le présent document fait valoir que la coordination entre le commerce intérieur et le commerce extérieur reflète la complexité du commerce sur le marché d'un pays (en particulier sur les grands marchés). La littérature empirique récente souligne également la relation étroite entre le commerce intérieur et le commerce extérieur. Le commerce intérieur peut favoriser des ajustements à la propension à l'exportation en renforçant l'appariement de l'offre et de la demande et en réduisant la fragmentation du marché et les coûts de transaction (Zhang, 2014). En outre, le commerce intérieur peut également accroître l'effet de retombées techniques du commerce extérieur et peut entraîner des retombées technologiques supplémentaires par le biais de liens étroits entre les deux secteurs commerciaux.

Outre le perfectionnement des indicateurs commerciaux, la question centrale est d'identifier davantage la manière de prendre des accords commerciaux afin qu'ils aient un impact positif, tout en évitant les effets négatifs du commerce sur l'innovation technologique. Il est important d'envisager la péréquation et la spécialisation entre le commerce intérieur et le commerce extérieur lorsque la coordination de ces facteurs est incluse dans la recherche sur l'effet de retombées technologiques. Indépendamment de l'intégration économique entre les différents pays, il y a toujours eu des activités professionnelles dans les secteurs du commerce intérieur et extérieur, car elles suivent des paradigmes différents et sont soumises à des règles commerciales différentes. Sous la contrainte de la frontière de possibilité de production, il faut décider comment les ressources sont allouées entre les deux principaux secteurs commerciaux. Les ressources peuvent être concentrées dans l'un des secteurs, appelés spécialisation (ou spécialisation commerciale) dans ce document. Les ressources peuvent plutôt être réparties également entre les deux secteurs, appelées péréquation (ou péréquation commerciale). Par conséquent, les deux principaux secteurs commerciaux (intérieur et étranger) devraient coordonner et interconnecter. Les différents effets de la péréquation et de la spécialisation des deux secteurs doivent également être pris en compte. Basé sur la théorie des retombées technologiques dans le commerce international, ce document traite de l'effet de l'innovation technologique du commerce en tenant compte de l'influence du commerce intérieur et en construisant les indicateurs des liens entre le commerce intérieur et le commerce extérieur.

La contribution du document réside dans les aspects suivants : premièrement, les recherches antérieures ont principalement porté sur la relation entre le commerce international et l'innovation technologique, tout en ignorant l'impact du commerce intérieur. Ce document, en mesurant le niveau de développement coordonné entre le commerce intérieur et le commerce extérieur, examine plus en détail l'impact du commerce sur l'innovation technologique. Deuxièmement, dans la condition de la contrainte des ressources, il y a soit la complémentarité (péréquation commerciale) soit la substituabilité (spécialisation commerciale) entre le commerce intérieur et le commerce extérieur dans le développement des deux secteurs. Après avoir examiné les théories des retombées technologiques ainsi que la péréquation et la spécialisation des deux secteurs commerciaux, ce document analyse le mécanisme de la façon dont le développement coordonné du commerce affecte l'innovation technologique. Troisièmement, certaines études classent l'innovation en innovation radicale et en innovation progressive (mars 1991). Ce document analyse l'impact de la péréquation commerciale et de la spécialisation sur différents types d'innovation.

L'article est structuré comme suit : La section 2, axée sur la perspective des retombées technologiques, traite de la façon dont le développement coordonné du commerce intérieur et du commerce international travaille ensemble pour influencer l'innovation technologique, et comment la péréquation et la spécialisation commerciales affectent différents types d'innovation. La section 3 construit l'indice de coordination commerciale et décrit les tests empiriques à l'aide du modèle à effet fixe, du modèle quantile du panneau, et ainsi de suite. La section 4 traite des conclusions et des répercussions de la recherche future.

CONCLUSION

Ce document a examiné l'effet du commerce sur l'innovation technologique, en particulier du point de vue de l'interaction entre le commerce intérieur et le commerce extérieur. Le commerce extérieur influe sur l'innovation provenant des retombées technologiques telles que l'imitation, la concurrence, les liaisons en amont et en aval. Les résultats présentés dans le présent document montrent que le développement coordonné du commerce intérieur et étranger entraîne des effets sur l'innovation principalement par l'effet de diffusion de l'information, l'effet moteur de la concurrence et l'effet d'optimisation de la chaîne de valeur. Cela renforcera les retombées technologiques et améliorera ainsi l'innovation technologique. En outre, le développement coordonné du commerce intérieur et étranger est classé dans la péréquation du commerce et la spécialisation commerciale. La péréquation commerciale favorise principalement des développements progressifs, tandis que la spécialisation commerciale améliore l'innovation radicale. Il convient de noter que, bien que ce document divise l'innovation technologique en deux types (radical et progressif), cela ne signifie pas que le premier est plus bénéfique pour le développement économique régional que l'autre. Étant donné que le stade du développement économique et la structure industrielle diffèrent selon les régions, l'innovation radicale peut répondre aux besoins de développement de certains domaines, mais être contre-productive dans d'autres domaines où l'innovation progressive est plus conforme à la situation réelle, puis promouvoir le développement économique dans ces domaines.

Ce document construit des variables indirectes qui reflètent la péréquation et la spécialisation du commerce. Le nombre de demandes de brevet est défini comme la variable dépendante, combinée avec le modèle de panneau à effet fixe et le modèle quantile de panneau à effet fixe. Le document examine le rôle que joue la péréquation commerciale ou la spécialisation commerciale en ce qui concerne les différents types d'innovation technologique. Les résultats empiriques soutiennent les prédictions théoriques.

Dans cet article, nous développons une construction nommée coordination commerciale qui peut être bien estimée et évaluée par les méthodes empiriques que nous donnons ci-dessus. D'autres études incluent l'exploration de la relation entre la coordination commerciale et d'autres variables telles que la propension à l'investissement ou la productivité totale des facteurs. L'étude des variables antécédents est également importante pour des politiques spécifiques visant à améliorer la coordination commerciale. Ss (ss)

TRANSLATED VERSION: GERMAN

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EINLEITUNG

In Solows Wirtschaftswachstumsmodell ist das technische Niveau die treibende Kraft, die zu weiterem Wirtschaftswachstum führt, wenn der Kapitaleinsatz eines Landes einen stabilen Zustand erreicht, und technologische Innovation ist eine wichtige Quelle des technologischen Fortschritts. Unter den zahlreichen und komplizierten Faktoren, die die technologische Innovation beeinflussen, wurde seit jeher großer Wert auf den Handel gelegt. Die einschlägigen Studien konzentrieren sich jedoch hauptsächlich auf den technologischen Innovationseffekt aus der Perspektive des internationalen Handels und berücksichtigen selten den Verknüpfungseffekt des Inlandshandels.

Die wichtigsten Schlussfolgerungen der bestehenden Literatur, die sich auf den internationalen Handel konzentriert, weisen darauf hin, dass der technologische Innovationseffekt des Handels sowohl Importeure

als auch Exporteure beeinflussen kann. Der internationale Handel kann entweder das technologische Niveau der Produktionstätigkeiten im Einfuhrland durch hochwertige Zwischenprodukte verbessern (Tradee and Helpman, 1993; Grossman und Helpman, 1991) oder verbesserung des technologischen Niveaus des Ausfuhrlandes durch Erstausrüstungshersteller sowie Verarbeitungshandel. Einige Studien argumentieren, dass sich die positiven Auswirkungen des Außenhandels auf die technologische Innovation auf die entwickelten Länder beschränken (Coe und Helpman, 1995). Sie schlagen vor, dass die Entwicklungsländer wahrscheinlich die technologische Innovationsfähigkeit ihrer lokalen Unternehmen im Außenhandel aufgrund einer Low-End-Sperre in der Wertschöpfungskette und einer übermäßigen Abhängigkeit von internationalen Märkten verlieren (Stokey, 1991; Young, 1991). Aufgrund der Unterschiede in Bezug auf die wirtschaftliche Entwicklung und den industriellen Wettbewerb ändert sich die tatsächliche Wirkung des Handels auf technologieinnovation. In diesem Papier wird argumentiert, dass die Koordinierung zwischen Inlands- und Außenhandel die Komplexität des Handels auf dem Markt eines Landes (insbesondere auf großen Märkten) widerspiegelt. Die jüngste empirische Literatur weist auch auf die enge Beziehung zwischen Inlands- und Außenhandel hin. Der Binnenhandel kann Anpassungen der Exportneigung fördern, indem er die Angebotsanpassung stärkt und die Marktfragmentierung und Transaktionskosten senkt (Zhang, 2014). Darüber hinaus kann der Inlandshandel auch die technischen Spillover-Effekte des Außenhandels verstärken und durch die engen Verbindungen zwischen den beiden Handelssektoren zu zusätzlichen Auswirkungen auf Technologie-Spillover führen.

Neben der Verfeinerung der Handelsindikatoren geht es im Kern darum, weiter zu ermitteln, wie Handelsvereinbarungen getroffen werden können, damit sie sich positiv auswirken, während gleichzeitig die negativen Auswirkungen des Handels auf technologische Innovationen vermieden werden. Es ist wichtig, die Ausgleichs- und Spezialisierung zwischen Inlands- und Außenhandel in Betracht zu ziehen, wenn die Koordinierung dieser Faktoren in die Forschung über den technologischen Spillover-Effekt einbezogen wird. Ungeachtet der wirtschaftlichen Integration zwischen den verschiedenen Ländern gab es immer berufliche Tätigkeiten im In- und Außenhandel, da sie unterschiedlichen Paradigmen folgen und unterschiedlichen Handelsregeln unterliegen. Unter dem Zwang der Produktionsmöglichkeit an der Grenze muß entschieden werden, wie die Mittel auf die beiden großen Handelssektoren aufgeteilt werden. Die Mittel können in einem der Sektoren konzentriert werden, die in diesem Papier als Spezialisierung (oder Handelsspezialisierung) bezeichnet werden. Die Mittel können stattdessen gleichmäßig auf die beiden Sektoren aufgeteilt werden, die als Ausgleich (oder Handelsausgleich) bezeichnet werden. Daher sollten sich die beiden wichtigsten Handelssektoren (in- und ausland) koordinieren und miteinander vernetzen. Die verschiedenen Auswirkungen des Ausgleichs und der Spezialisierung der beiden Sektoren müssen ebenfalls berücksichtigt werden. Basierend auf der Theorie des Technologie-Spillovers im internationalen Handel diskutiert dieses Papier die technologische Innovationswirkung des Handels, indem der Einfluss des Inlandshandels berücksichtigt und die Indikatoren der inländischen und außenhandellichen Verflechtung erstellt werden.

Der Beitrag des Papiers liegt in folgenden Aspekten: Erstens konzentrierte sich die bisherige Forschung in erster Linie auf die Beziehung zwischen internationalem Handel und technologischer Innovation, wobei die Auswirkungen des Inlandshandels ignoriert wurden. In diesem Papier werden die Auswirkungen des Handels auf die technologische Innovation umfassender untersucht, indem der Grad der koordinierten Entwicklung zwischen Inlands- und Außenhandel gemessen wird. Zweitens gibt es unter der Bedingung der Ressourcenknappheit entweder Komplementarität (Handelsausgleich) oder Substituierbarkeit (Handelsspezialisierung) zwischen Inlands- und Außenhandel bei der Entwicklung der beiden Sektoren. Nach Berücksichtigung von Theorien über Technologie-Spillover sowie Ausgleich und Spezialisierung der beiden Handelssektoren analysiert dieses Papier den Mechanismus, wie koordinierte Entwicklung des Handels technologische Innovation beeinflusst. Drittens werden Innovation in einige Studien in radikale Innovation und inkrementelle Innovation eingeordnet (März 1991). In diesem Beitrag werden die Auswirkungen des Handelsausgleichs und der Spezialisierung auf verschiedene Arten von Innovationen analysiert.

Der Artikel ist wie folgt aufgebaut: Abschnitt 2, der sich auf die Perspektive des Technologie-Spillovers konzentriert, diskutiert, wie die koordinierte Entwicklung des Inlandshandels und des internationalen

Handels zusammenarbeiten, um technologische Innovationen zu beeinflussen, und wie sich Handelsausgleich und -spezialisierung auf verschiedene Arten von Innovation auswirken. Abschnitt 3 erstellt den Index der Handelskoordination und beschreibt empirische Tests anhand des Modells mit festem Effekt, des Panelquantilmodells usw. In Abschnitt 4 werden die Schlussfolgerungen und Auswirkungen auf die künftige Forschung erörtert.

SCHLUSSFOLGERUNG

In diesem Papier wurden die Auswirkungen des Handels auf die technologische Innovation erörtert, insbesondere aus der Perspektive der Wechselwirkung zwischen Inlands- und Außenhandel. Der Außenhandel wirkt sich auf Innovationen aus Technologie-Spillover wie Nachahmung, Wettbewerb, vor- und nachgelagerte Verbindungen aus. Die in diesem Beitrag vorgestellten Ergebnisse zeigen, dass die koordinierte Entwicklung des Inlands- und Außenhandels vor allem durch den Informationsdiffusionseffekt, den wettbewerbstreibenden Effekt und den Wertschöpfungskettenoptimierungseffekt zu Auswirkungen auf die Innovation führt. Dies wird die Technologie-Spillover stärken und damit die technologische Innovation fördern. Darüber hinaus wird die koordinierte Entwicklung des Inlands- und Außenhandels in Handelsausgleich und Handelsspezialisierung eingeteilt. Der Handelsausgleich fördert hauptsächlich inkrementelle Entwicklungen, während die Spezialisierung des Handels radikale Innovationen verbessert. Es ist erwähnenswert, dass dieses Papier zwar technologische Innovation in zwei Arten (radikal und inkrementell) unterteilt, aber nicht bedeutet, dass erstere für die regionale Wirtschaftsentwicklung vorteilhafter ist als die andere. Da sich die wirtschaftliche Entwicklungsphase und die Industriestruktur in den einzelnen Regionen unterscheiden, können radikale Innovationen den Entwicklungsbedürfnissen bestimmter Gebiete entsprechen, aber in anderen Bereichen, in denen die schrittweise Innovation eher der tatsächlichen Situation entspricht, kontraproduktiv sein und dann die wirtschaftliche Entwicklung in diesen Bereichen fördern.

Dieses Papier erstellt Proxy-Variablen, die die Entzerrung und Spezialisierung des Handels widerspiegeln. Die Anzahl der Patentanmeldungen wird als abhängige Variable festgelegt, kombiniert mit dem Modell des festen Effektpanels und dem Quantilmodell des festeffektpanels. In dem Papier wird untersucht, welche Rolle der Handelsausgleich oder die Fachspezialisierung bei verschiedenen Arten technologischer Innovation spielt. Die empirischen Ergebnisse stützen die theoretischen Vorhersagen.

In diesem Beitrag entwickeln wir ein Konstrukt namens Handelskoordination, das anhand der empirischen Methoden, die wir oben nennen, gut eingeschätzt und bewertet werden kann. Weitere Studien umfassen die Untersuchung des Zusammenhangs zwischen der Handelskoordinierung und anderen Variablen wie Investitionsneigung oder Gesamtfaktorproduktivität. Die Untersuchung von Vorläufervariablen ist auch für spezifische Politiken zur Verbesserung der Handelskoordinierung wichtig. Ss

TRANSLATED VERSION: PORTUGUESE

Below is a rough translation of the insights presented above. This was done to give a general understanding of the ideas presented in the paper. Please excuse any grammatical mistakes and do not hold the original authors responsible for these mistakes.

VERSÃO TRADUZIDA: PORTUGUÊS

Aqui está uma tradução aproximada das ideias acima apresentadas. Isto foi feito para dar uma compreensão geral das ideias apresentadas no documento. Por favor, desculpe todos os erros gramaticais e não responsacule os autores originais responsáveis por estes erros.

INTRODUÇÃO

No modelo de crescimento econômico de Solow, quando o insumo capital-trabalho de um país atinge um estado estável, o nível técnico é a força motriz que leva a um crescimento econômico maior, e a inovação tecnológica é uma importante fonte de progresso tecnológico. Sempre foi dada grande ênfase ao comércio entre os inúmeros e complicados fatores que afetam a inovação tecnológica. Os estudos relevantes focam principalmente no efeito inovação tecnológica na perspectiva do comércio internacional, no entanto, e raramente consideram o efeito de vinculação do comércio interno.

As principais conclusões da literatura existente com foco no comércio internacional observam que o efeito de inovação tecnológica do comércio pode influenciar simultaneamente tanto importadores quanto exportadores. O comércio internacional pode melhorar o nível tecnológico das atividades produtivas no país importador por meio de produtos intermediários de alta qualidade (Tradee e Helpman, 1993; Grossman e Helpman, 1991), ou melhoram o nível tecnológico do país exportador por meio do Fabricante original de Equipamentos, bem como do comércio de processamento. Alguns estudos argumentam que o impacto positivo do comércio exterior na inovação tecnológica está restrito aos países desenvolvidos (Coe e Helpman, 1995). Eles propõem que os países em desenvolvimento provavelmente percam a capacidade de inovação tecnológica de suas empresas locais no comércio exterior devido ao bloqueio de baixa qualidade na cadeia de valor e dependência excessiva dos mercados internacionais (Stokey, 1991; Young, 1991). Devido às diferenças relacionadas ao desenvolvimento econômico e à concorrência industrial, o efeito real do comércio sobre a inovação tecnológica está mudando. Este artigo argumenta que a coordenação entre o comércio interno e externo reflete a complexidade do comércio no mercado de um país (especialmente nos grandes mercados). A literatura empírica recente também aponta para a estreita relação entre o comércio interno e externo. O comércio interno pode promover ajustes na propensão à exportação, fortalecendo a correspondência entre oferta e demanda e reduzindo os custos de fragmentação e transação do mercado (Zhang, 2014). Além disso, o comércio interno também pode aumentar o efeito de repercussão técnica do comércio exterior e pode levar a efeitos adicionais de repercussão tecnológica através das conexões estreitas entre os dois setores comerciais.

Além do refinamento dos indicadores comerciais, a questão central é identificar ainda mais como fazer arranjos comerciais para que tenham um impacto positivo, evitando os efeitos negativos do comércio sobre a inovação tecnológica. É importante considerar a equalização e a especialização entre o comércio interno e externo quando a coordenação desses fatores é incluída em pesquisas sobre o efeito de repercussão tecnológica. Independentemente da integração econômica entre diferentes países, sempre houve atividades profissionais nos setores de comércio interno e externo, pois seguem paradigmas diferentes e estão sujeitos a diferentes regras comerciais. Sob a restrição da fronteira de possibilidade de produção, deve-se decidir como os recursos são alocados entre os dois principais setores do comércio. Os recursos podem ser concentrados em um dos setores, chamados de especialização (ou especialização comercial) neste artigo. Os recursos podem, em vez disso, ser alocados igualmente entre os dois setores, chamados de equalização (ou equalização comercial). Portanto, os dois principais setores comerciais (nacionais e estrangeiros) devem coordenar e interligar. Os diversos efeitos da equalização e especialização dos dois setores também precisam ser considerados. Com base na teoria da repercussão tecnológica no comércio internacional, este artigo discute o efeito inovação tecnológica do comércio, levando em conta a influência do comércio interno e a construção dos indicadores de ligação entre o comércio interno e externo.

A contribuição do artigo reside nos seguintes aspectos: Primeiro, pesquisas anteriores se concentraram principalmente na relação entre comércio internacional e inovação tecnológica, ignorando o impacto do comércio interno. Este artigo, ao medir o nível de desenvolvimento coordenado entre o comércio interno e externo, examina de forma mais abrangente o impacto do comércio na inovação tecnológica. Em segundo lugar, sob a condição de restrição de recursos, há complementaridade (equalização comercial) ou substituição (especialização comercial) entre o comércio interno e externo no desenvolvimento dos dois setores. Tendo considerado teorias de repercussão tecnológica, bem como equalização e especialização dos dois setores comerciais, este artigo analisa o mecanismo de como o desenvolvimento coordenado do comércio afeta a inovação tecnológica. Em terceiro lugar, alguns estudos classificam a inovação em

inovação radical e inovação incremental (março de 1991). Este artigo analisa o impacto da equalização e especialização comercial em diferentes tipos de inovação.

O artigo está estruturado da seguinte forma: A Seção 2, com foco na perspectiva da repercussão tecnológica, discute como o desenvolvimento coordenado do comércio interno e do comércio internacional trabalham juntos para influenciar a inovação tecnológica, e como a equalização e especialização comercial afetam diferentes tipos de inovação. A Seção 3 constrói o índice de coordenação comercial e descreve testes empíricos usando o modelo de efeito fixo, o modelo quântico do painel e assim por diante. A Seção 4 discute as conclusões e implicações para futuras pesquisas.

CONCLUSÃO

Este artigo discutiu o efeito que o comércio tem sobre a inovação tecnológica, especialmente na perspectiva da interação entre o comércio interno e externo. O comércio exterior afeta a inovação a partir da repercussão tecnológica, como imitação, concorrência, upstream e downstream links. Os achados apresentados neste artigo mostram que o desenvolvimento coordenado do comércio interno e externo leva a efeitos sobre a inovação principalmente por meio do efeito de difusão da informação, efeito de condução da concorrência e efeito de otimização da cadeia de valor. Isso fortalecerá a repercussão tecnológica e, assim, melhorará a inovação tecnológica. Além disso, o desenvolvimento coordenado do comércio interno e externo é classificado em equalização comercial e especialização comercial. A equalização comercial promove principalmente a evolução incremental, enquanto a especialização comercial melhora a inovação radical. Vale ressaltar que, embora este artigo divida a inovação tecnológica em dois tipos (radical e incremental), não significa que o primeiro seja mais benéfico para o desenvolvimento econômico regional do que o outro. Uma vez que o estágio de desenvolvimento econômico e a estrutura industrial diferem em diferentes regiões, a inovação radical pode atender às necessidades de desenvolvimento de determinadas áreas, mas ser contraproducente em outras áreas onde a inovação incremental está mais alinhada com a situação real e, em seguida, promover o desenvolvimento econômico nessas áreas.

Este artigo constrói variáveis proxy que refletem a equalização e especialização do comércio. O número de pedidos de patente é definido como a variável dependente, combinado com o modelo de painel de efeito fixo e o modelo quântico do painel de efeito fixo. O artigo analisa o papel que a equalização comercial ou a especialização comercial desempenham em relação a diferentes tipos de inovação tecnológica. Os resultados empíricos apoiam as previsões teóricas.

Neste artigo, desenvolvemos uma construção chamada coordenação comercial que pode ser bem estimada e avaliada pelos métodos empíricos que damos acima. Outros estudos incluem explorar a relação entre a coordenação comercial e outras variáveis, como propensão a investimentos ou produtividade total do fator. O estudo das variáveis antecedentes também é importante para políticas específicas para melhorar a coordenação comercial. Ss