

Non-harmonised Mandatory Standards as Non-Tariff Barriers : Experience from Japanese Imports

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Résumé

The WTO TBT agreement has been promoting to harmonise national standards with relevant international standards worldwide since 1995. Such a harmonisation of the standards may reduce trade costs stem from the differences between national standards across countries, and then would facilitate international trade. Although the standards are voluntary by definition, some national standards are mandatory since mandatory statutes in home country require all producers to adopt one or more specific national standards for products. Accordingly, if national standards are mandatory and non-harmonised, they function as non-tariff barriers to trade in the home country.

In this paper, we empirically examine the effects of the standards harmonisation and the mandatory standards on international trade flows, especially the emergence of newly imported products in Japan. Our results suggest that non-harmonised national standards with mandatory statutes deter new entrants from foreign countries to home market. This empirical study is not possible without our new concordance between international standards and HS 6-digit products.

Keywords : International Standards, Harmonisation, Mandatory statutes, International trade

JEL Classification : F13 ; F14 ; K32

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1 Introduction

The member countries of the World Trade Organisation (WTO) has been required to adopt international standards for an internationally traded product if an relevant international standard exists for it since the Agreement on Technical Barriers to Trade (TBT) of the WTO has come in to effect in 1995. In principle, national standards in each member country have been required to be harmonised with international standards. Thus, the standards harmonisation is expected to have significantly accelerated among the member countries under the WTO TBT agreement. Consequently, international trade would be facilitated by the reduction of the trade costs resulting from non-harmonised national standards across countries. According to Mangelsdorf (2011), which is one of the pioneering works in the research on the effects of standards harmonisation on international trade, internationally harmonised national standards have positive impact on the volume of international trade. He has empirically analysed the effects of the harmonisation of Chinese national standards with international standards on Chinese export and import with European Union.

Although the WTO TBT agreement has been promoting the harmonisation of standards worldwide, it is still far from completion. For example, according to the data on the degree of harmonisation of Japanese national standards collected by Japanese Standards Association (JSA)¹, Japanese national standards - Japanese Industrial Standards (JIS) - has not been entirely harmonised with international standards by 2014.

In this paper, we will investigate the effects of both non-harmonised and harmonised Japanese national standards on Japanese imports, especially new foreign products' entrances to Japanese market through import. First, this paper empirically examines the effects of harmonisation of national standards with international standards promoted by the WTO TBT agreement on an expansion of international trade between countries since the standards harmonisation decreases the entrance costs of foreign producers. In order to evaluate the expansion of international trade we will identify new import entrants² to home market at HS 6-digit product level. Second, we will take the effects of mandatory statutes³ on international trade into consideration. The mandatory statutes in home country force all domestic and foreign producers to cite one or more specific national standards if they plan to sell their products in home country. Thus, such national standards is considered to be mandatory. For this reason, mandatory standards would increase entrance costs of foreign producer. In addition, if a mandatory statute forces to cite a non-harmonised national standard, then it would hinder international trade in goods since such differences between home and foreign national standards will clearly impose the costs to adjust to home country's national standards. Hence, non-harmonised mandatory standards would increase entrance costs of new entrants to home market even more.

1. JSA is national standards body in Japan

2. The measurement method of the new import entrants in this paper will be explained later in Section 3.

3. International standards and national standards are generally voluntary unless mandatory statutes or compulsory laws require producers to cite specific standards. In this paper we call the standards which are required to cite by mandatory statutes as mandatory standards.

The reminder of this paper is structured as follows. In Section 2 we review the empirical preceding papers regarding the effects of standardisation and international trade flows. In Section 3 we develop our empirical model to analyse the effects of harmonisation of Japanese national standards with international standards on Japanese imports, especially newly imported products to Japanese market, and will provide some results from our empirical analysis. Then, we will conclude our empirical analysis results in Section 4.

2 Preceding studies in International standards and International trade

We will review the results of preceding studies regarding the effects of standardisation on international trade flows in both theoretical and empirical analyses. There are two perspectives toward the effects of standardisation on international trade. One is to consider standards as a trade barrier. This view indicates that the standardisation has a negative impact on international trade. The other is to consider standardisation as catalyst of international trade in that standards have a positive impact on international trade.

Blind (2004) summarised that the theoretical discussions on standardisation can be linked with a wide range of topics in economics. Similarly, Swann (2010a, b) summarised that the empirical studies about standardisation are conducted from a board set of perspectives. In this Section 2, we will focus on the discussions regarding the effects of standardisation on international trade.

As in documented in Blind (2004), standardisation may affect international trade flow positively since it would reduce transaction costs, such as search costs and information cost, between exporters and importers. For example, Jones and Hudson (1996) theorised that the standardisation of products might reduce the costs of uncertainty attributed to a buyer's product quality examination. They pointed out that one of the important effects of standardisation is to reduce a variation in product quality among varieties. For instance, if standardisation imposes a minimum product quality, then buyer can search out its suitable product within narrower range of product quality, compared with the range without the standards. Therefore, standardisation may help to reduce the search costs of buyers. Butter et al. (2007) also indicates that standards have a function to reduce transaction costs, especially related to value-chains, since it tends to require more coordination activities between production stages located in foreign countries. As discussed by them, when buyers and sellers deal with standardised products, they only need to negotiate price and delivery conditions with each other. It means that they can complete their transaction with smaller transaction costs compared with the transaction costs of non-standardised products. Similarly, Ijiri et al. (2013), Moenius (2006), Portugal-Perez et al. (2009), and Shepherd (2007) find that, generally, standardisation affects trade flows positively.

In addition, as well explained in Chaney (2008), the reduction of fixed trade costs expand more the extensive margins of trade than the intensive margins of trade. The expansion of the extensive margins of trade indicates the emergence of new entrants to home market in case of imports. In turn, adjustment costs stems from the standards difference from home and foreign countries are considered as fixed trade costs since

foreign producers using different standards have to pay this fixed trade cost only when they enter the home market first time. Hence, the standards harmonisation may reduce such fixed trade costs and thus increase the emergence of new foreign entrants to home market.

85 On the other hand, only a few papers have empirically examined the effects of harmonisation of standards across countries on international trade flows so far. For example, Czubala et al. (2009) examine the impact of EU standards on African textiles and clothing exports to European economies. They find that non-harmonised standards reduce exports of African products in the industries. Similarly, Mangelsdorf (2011)
90 studied the effects of the harmonisation of Chinese national standards with international standards on Chinese export and import with European Union. He reported that the internationally harmonised Chinese standards for products in 36 industries have increased the volume of international trade between China and EU. As documented in these previous papers, non-harmonised national standards are considered to be a trade deterrent
95 factor, whereas international standards and harmonised national standards are considered to be a trade-facilitating factor.

3 Empirical Analysis and Results

Our empirical analysis strategy and the data we use in this paper are summarised as follows.

100 Similar to the preceding papers on standardisation, our first hypothesis is that international standards may decrease trade costs, such as transaction costs, adjustment costs and so on, since in principle international standards require all producers to use the same standards across countries for internationally traded products. Hence, a publication of international standards to products may increase international trade flows by inducing
105 new entrants from foreign countries into home market, as indicated by the expansion of the extensive margins of trade in Chaney (2008). For example, in case of an increase in trade volume of home market, there are two ways to increase it. One is new entrants from existing trade partner countries, and the other is new entrants from new trade partner countries. We will decompose the increase of trade volume into such two factors.

110 In order to distinguish between the two types of new foreign entrants into home market, we measure new entrants from new partner countries in HS 6-digit products. Here, we call the new entrants as Newly Traded Products (NTPs). As we focus on Japanese imports in this paper, it is, of course, Newly Imported Products (NIPs) in Japan. This NIPs is measured in the following method. NIPs has a binary value, either 0 or 1.
115 We put 1 in year t in the case that there is no import value of product k from country i in year $t-1$ and positive import value of that product from country i in year t , $t+1$ and $t+2$ (i.e., three years in row), otherwise we put 0 in year t .

Our interest is whether such emergences of NIPs in Japan have been caused by the international standardisation or not. Especially, the emergence of NIPs from a new trade
120 partner in Japan means an increase in the number of import partners of Japan for a traded product. It is different from a change in the size of trade value in that the changes in trade value do not necessarily mean the increase of trade partners.

Our second hypothesis is that mandatory statutes (compulsory law) require a producer to conform specific standards for its products. If a mandatory statute, such as Building Standards Act, Air Pollution Control Act, Fire Service Act and so on, orders to cite a non-harmonised national standard, it would exert a negative impact on international trade as a trade barrier. Since non-harmonised national standards are not matched with a relevant international standard if exists, foreign producers have to adjust their products in order to fulfil national standards cited by a mandatory statute in export destination country by paying extra trade costs. Hence, non-harmonised standards may be a trade barrier to foreign products that cite different standards from national standards. We will empirically test these two hypotheses in next section.

3.1 JSA Standards Data

JIS (Japanese Industrial Standards) is Japanese national standards for industrial and mining products. Its legal basis is the Japanese Standards Law. The purpose of this law is to promote industrial standardisation by establishing appropriate industrial national standards in Japan. The number of the existing published JIS is 10,525 in March 2014.

As mentioned previously, the WTO TBT requires its member countries to harmonise its national standards with international standards in order to reduce non-tariff barriers stem from differences between national standards and international standards if relevant international standards exist. Thus, it is important to examine whether the standard harmonisation have reduced trade barriers or not. However, it is usually not publicly accessible to national standards database which contains the information regarding the standards harmonisation.

We have successfully accessed to the database of JIS compiled by Japan Standards Association (JSA). This database contains the detail information of each JIS standard, such as name of JIS, publication date, JIS classification code, relevant ICS codes, corresponding mandatory statutes or compulsory provisions and so on. The most important one for this paper is the information about status of harmonisation of each Japanese national standard with international standards, i.e., ISO/IEC standards.

3.2 Concordance between products and standards

Ijiri, Yamano and Miao (2013) use their original concordance between ICS and HS 6-digit products for its analysis on the effects of international standardisation on bilateral trade flows between 57 countries including both OECD and selected non-OECD countries. They use the concordance developed by Ijiri and Haneda (2012). The concordance covers all HS 6-digit products and shows the matched results between HS 6-digit product and 5 or 7-digit ICS codes. This is the only existing concordance between full HS 6-digit products and ICS. However, it is not the concordance between HS 6-digit products and each ISO/IEC standard. This is one of the shortcomings of their concordance.

We have tried to make up for the shortcoming of Ijiri and Haneda's concordance by developing a new concordance between each HS 6-digit product and ISO/IEC standard⁴.

4. Ijiri and Haneda (2015) documents the detailed information of this new concordance.

It does not cover all HS products, but covers HS products in ISIC 29 to ISIC 35 industries⁵. Using the name, short explanation and ICS code of each ISO/IEC standard, we have judged relevancy of each ISO/IEC standard and one or more HS 6-digit products, and then mapped the most relevant HS 6-digit products with ISO/IEC standards. We also identify the year of product-type switch from non-standardised products to standardised product by considering the publication year of each international standard. If more than two international standards are mapped with a HS 6-digit product, we use the publication year of the first international standards. We are able to know the year of becoming a standardised product using our new concordance. The concordance covers 1196 HS 6-digit products in the industries from ISIC 29 to ISIC 35. We also collect End-use category for those products from The OECD STAN Bilateral Trade Database by Industry and End-Use (BTDIxE).

Based on the JSA database, the Japanese Industrial Standards (JIS) is possibly to be categorised into the following group by using our concordance between ISO and HS, since the JSA data contains the corresponding ISO/IEC standards codes to each JIS if available (unfortunately not all JIS have its corresponding ISO/IE C standards codes). The results of mapped JIS with ISO/IEC standards are reported in Table 1.

TABLE 1 – The results of Harmonisation of JIS with ISO/IEC standards by JIS classification codes

Code	Description	Number				Share		
		Total	IDT	MOD	NEQ	IDT	MOD	NEQ
A	Civil Engineering and Architecture	920	72	127	1	8%	14%	0%
B	Mechanical Engineering	2613	466	638	40	18%	24%	2%
C	Electronic and Electrical Engineering	2664	650	698	71	24%	26%	3%
D	Automotive Engineering	555	37	151	5	7%	27%	1%
E	Railway Engineering	319	2	41	1	1%	13%	0%
F	Shipbuilding	873	65	56	14	7%	6%	2%
G	Ferrous Materials and Metallurgy	628	54	184	7	9%	29%	1%
H	Nonferrous Materials and Metallurgy	723	18	135	4	2%	19%	1%
K	Chemical Engineering	3269	340	651	15	10%	20%	0%
L	Textile Engineering	654	8	114	9	1%	17%	1%
M	Mining	295	6	70	4	2%	24%	1%
P	Pulp and Paper	145	17	54	0	12%	37%	0%
Q	Management System	99	79	6	0	80%	6%	0%
R	Ceramics	548	6	106	0	1%	19%	0%
S	Domestic Wares	489	13	16	3	3%	3%	1%
T	Medical Equipment and Safety Appliances	710	68	250	16	10%	35%	2%
W	Aircraft and Aviation	403	60	1	0	15%	0%	0%
X	Information Processing	771	460	145	4	60%	19%	1%
Z	Miscellaneous	1432	199	278	19	14%	19%	1%

Source : JSA Database

As shown in Table 1, the degrees of harmonisation of JIS with international standards

5. The industries in ISIC29/35 contain relatively mid- or high-tech manufacturing products : ISIC29 - Manufacture of machinery and equipment n.e.c., ISIC30 - Manufacture of office, accounting and computing machinery, ISIC31 - Manufacture of electrical machinery and apparatus n.e.c., ISIC32 - Manufacture of radio, television and communication equipment and apparatus, ISIC33 - Manufacture of medical, precision and optical instruments, watches and clocks, ISIC34 - Manufacture of motor vehicles, trailers and semi-trailers, ISIC35 - Manufacture of other transport equipment.

180 are complicated. The JSA categories the degrees of harmonisation into three groups :
 IDT, MOD, and NEQ. IDT indicates that JIS and international standards are identical
 (i.e., harmonised). MOD indicates that JIS is modified from its corresponding interna-
 tional standards and is not fully harmonised with it. And, NEQ indicates that JIS and
 185 international standards are not identical with each other. In addition, there should be
 some JIS that do not have any corresponding international standards. We consider such a
 JIS as non-harmonised national standard in this paper.

Table 1 shows the summary of the degrees of harmonisation of JIS. The classification
 code for JIS is organised with one alphabet and 4 digit numerical number. The total
 number of JIS published by 2014 is 18110, which includes branch standards. According
 190 to the JSA database, IDT is 14.5% of JIS, while MOD and NEQ are 20.5% and 1.2% of
 JIS, respectively. Accordingly, the reminder is also considered as non-harmonised JIS
 because of absence of corresponding international standards.

Based on these categories, we decide a degree of harmonisation of each HS 6-digit
 product in ISIC 29 to 35 industries. In fact, most of JIS have multiple corresponding
 195 international standards. Hence, it is not straightforward for us to decide each HS 6-digit
 product's degree of harmonisation. In this paper we use the following definitions in
 order to decide each product's degree of harmonisation : A harmonised standardised
 product has only corresponding JIS standards which are categorised as IDT, while a
 non-harmonised standardised product has a combination of some corresponding JIS
 200 standards which are categorised as at least two of these three categories ; IDT, MOD and
 NEQ.

Table 2 shows, in the upper part of the table, the total number of the published
 international standards up to the year from 1997 to 2011 by each mapped ISIC 2-digit
 industry and the number of HS 6-digit products in the industry. In the middle part of
 205 the table, the average number of published international standards is shown. The bottom
 of the table shows that the number of the published intentional standards in each year.
 According to Table 2, the total number of the published international standard in ISIC 29
 is the largest among the other industries in 2011. However, the largest average number of
 the published standards - the number of published standards per product- is in ISIC 33 in
 210 2011.

3.3 Some facts of Japanese imports from 1996 to 2013

We will summarise some results of the measurement of Newly Imported Products in
 Japan. Figure 1 shows the number of import partners in Japan each year from 1996 to 2013
 for all ISIC industries and the selected ISIC 29-35 industries. In this period the number
 215 of Japanese import partners in all ISIC has been slightly increased but fluctuated between
 192 and 209 countries. The number of partners in Japanese imports in ISIC29-35 have
 been increased from 147 to 182 countries by 2006 and then decreased to 153 countries
 in 2012. Figure 2 indicates that NIPs in Japan by end-use category each year has kept
 declining from 1999 to 2009. NIPs in Intermediates goods is the largest among End-use
 220 categories, followed by Household consumption (CONS) and Capital goods (CAP). As
 shown in Figure 3, the share of import value of NIPs in total import each year has been
 fluctuated from 0.10% to 2.06%, and is relatively smaller in recent years. According to

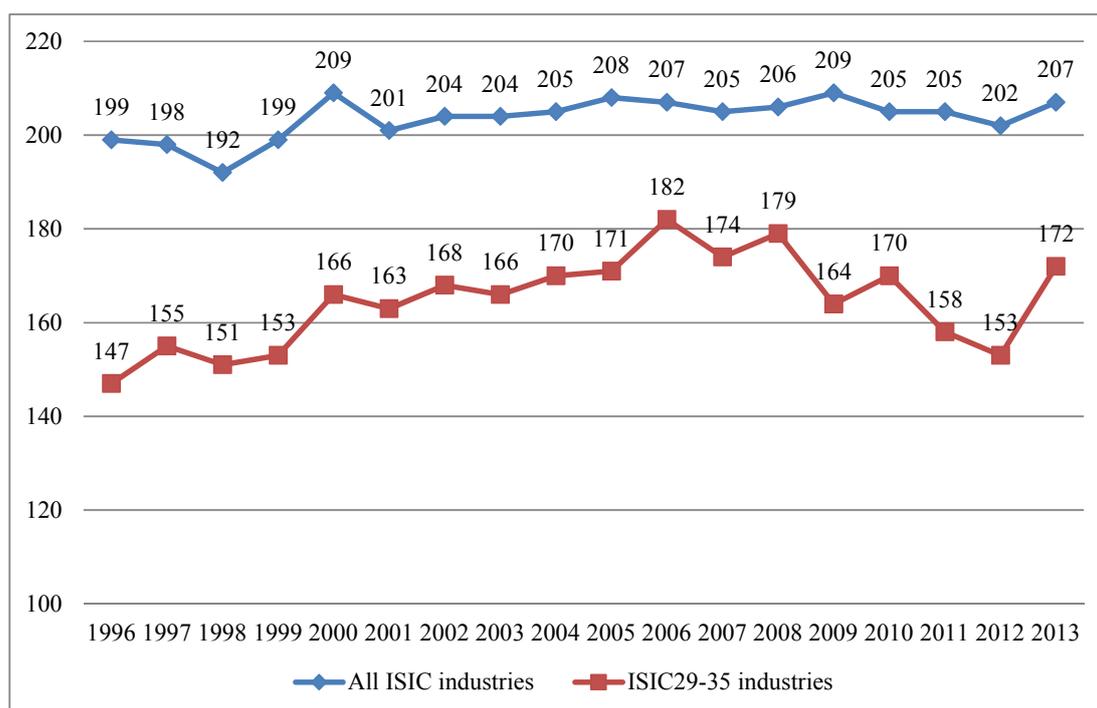


Figure 1 : The number of Japanese Import Partners
Source : Author's calculation using UN Comtrade Database

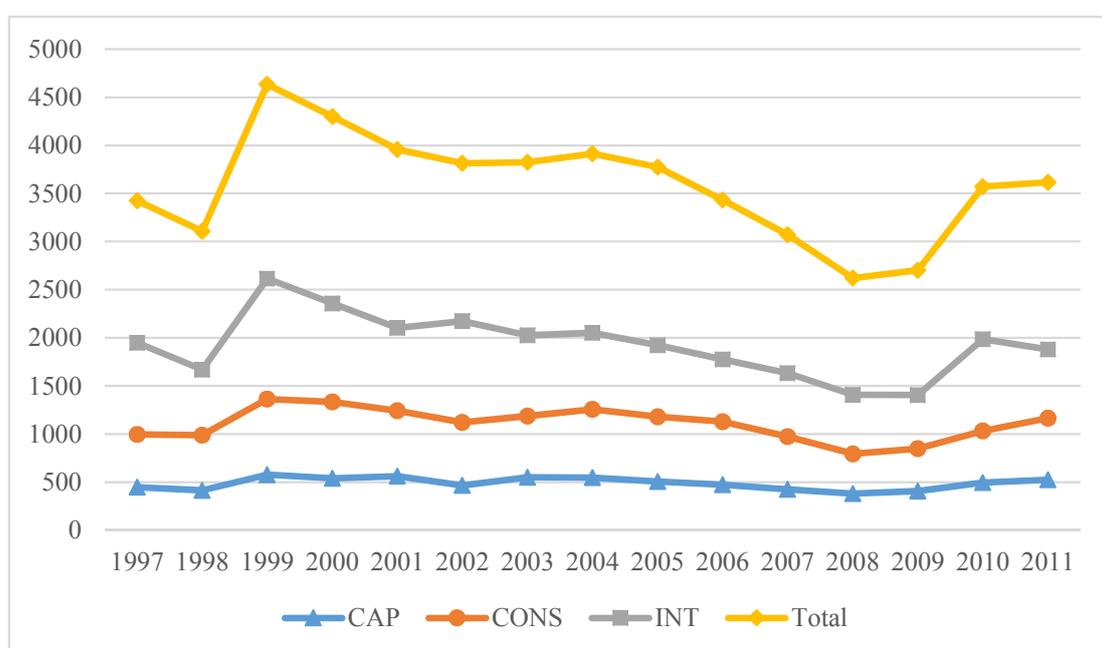


Figure 2 : The number of Newly Imported Products in Japan by End-use category
Source : Author's calculation using UN Comtrade Database

TABLE 2 – The degree of standardisation of the HS products in ISIC29 to 35 industries from 1997 to 2011

Stock of ISO/IEC standards																
ISIC	#HS	ISO/IEC														
		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
29	541	3,893	4,272	4,668	5,029	5,461	6,019	6,623	7,549	8,332	9,145	9,924	11,464	12,480	13,308	14,164
30	47	364	382	434	511	532	535	547	564	610	630	654	677	714	744	782
31	134	1,191	1,262	1,411	1,507	1,647	1,829	1,980	2,152	2,450	2,682	2,921	3,162	3,483	3,748	4,058
32	101	2,015	2,074	2,190	2,272	2,360	2,463	2,613	2,693	2,809	2,946	3,096	3,266	3,339	3,481	3,666
33	226	2,439	2,792	2,989	3,423	3,773	4,176	4,658	5,002	5,625	6,214	6,755	7,334	7,885	8,379	8,956
34	61	409	454	479	508	565	606	673	736	841	976	1,056	1,134	1,196	1,260	1,351
35	86	928	1,102	1,124	1,217	1,305	1,377	1,396	1,431	1,688	1,794	1,894	1,985	2,076	2,268	2,370

Average of ISO/IEC standards																
ISIC	#HS	ISO/IEC														
		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
29	541	7.20	7.90	8.63	9.30	10.09	11.13	12.24	13.95	15.40	16.90	18.34	21.19	23.07	24.60	26.18
30	47	7.74	8.13	9.23	10.87	11.32	11.38	11.64	12.00	12.98	13.40	13.91	14.40	15.19	15.83	16.64
31	134	8.89	9.42	10.53	11.25	12.29	13.65	14.78	16.06	18.28	20.01	21.80	23.60	25.99	27.97	30.28
32	101	19.95	20.53	21.68	22.50	23.37	24.39	25.87	26.66	27.81	29.17	30.65	32.34	33.06	34.47	36.30
33	226	10.79	12.35	13.23	15.15	16.69	18.48	20.61	22.13	24.89	27.50	29.89	32.45	34.89	37.08	39.63
34	61	6.70	7.44	7.85	8.33	9.26	9.93	11.03	12.07	13.79	16.00	17.31	18.59	19.61	20.66	22.15
35	86	10.79	12.81	13.07	14.15	15.17	16.01	16.23	16.64	19.63	20.86	22.02	23.08	24.14	26.37	27.56

Flow of ISO/IEC standards																
ISIC	#HS	ISO/IEC														
		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
29	541	456	379	396	361	432	558	604	926	783	813	779	1,540	1,016	828	856
30	47	23	18	52	77	21	3	12	17	46	20	24	23	37	30	38
31	134	194	71	149	96	140	182	151	172	298	232	239	241	321	265	310
32	101	138	59	116	82	88	103	150	80	116	137	150	170	73	142	185
33	226	427	353	197	434	350	403	482	344	623	589	541	579	551	494	577
34	61	44	45	25	29	57	41	67	63	105	135	80	78	62	64	91
35	86	113	174	22	93	88	72	19	35	257	106	100	91	91	192	102

Source : Author's calculation using the concordance (Ijiri and Haneda, 2015) and JSA Database

these measurement results of NIPs in Japan, we can mention that the emergence of NIPs has become relatively less since the mid-2000s.

225 3.4 Empirical Model

Our estimation strategy is summarised as follows. We use Newly Imported Products (NIPs) as a measure of the changes in international trade flows in Japan, emerged as the results of the harmonisation of JIS. The variable of NIPs is measured as explained in previous section and has a binary value, either 0 or 1.

230 We use Difference-In-Difference (DID) method for the analysis of the standards harmonisation effects on imports using Japanese trade data. This method allows us to statistically analyse the existence of a difference between a treatment group and a control group in the ex-post of an event. In this model, the treatment group is harmonised standardised products, while the control group is the rest of the observations in the dataset. The event in this model is the publication of international standards. That is, we estimate whether there is a difference in the emergence of NIPs between harmonised standardised products and non-harmonised standardised products in one year after the corresponding standards publication.

Taking into the discussion in Hellevik (2007) into consideration, we choose Linear
 240 Probability Model (LPM) as our estimation method.

$$NIP_{ij,t}^k = \beta_0 + \beta_1 \ln Y_{i,t} + \beta_2 \ln \tau_{ij,t} + \beta_3 \text{Treat}_t^k + \beta_4 \ln \text{Year}_t + \beta_5 \ln \text{TYear}_t + \varepsilon_{ij,t}^k \quad (1)$$

Y : GDP of country i (j for Japan, and i for partner country)

τ : *Tradecost*

Treat : Treatment group dummy (Treatment=1, otherwise 0)

Year : Year dummy for standards publication

245 TYear : Interaction term of Treat and Year

We have estimated the equation (1) for each ISIC 29-35 industry by each End-use category, Capital goods (CAP), Intermediates goods (INT) and Household consumption (COMP) in the period from 1997 to 2011.

250 3.5 Estimation Results

Our estimation results are shown in Table 3 and will be summarised as follows. We do not report all of the estimation results, but only report some important ones. Table 3 reports the selected estimation results in ISIC 29 industry for Intermediates goods and Capital goods, respectively, only with the mandatory standards published
 255 in 2005. The observations in the dataset are selected by the degrees of harmonisation : non-harmonised standardised products and harmonised standardised products. Model (1) and (2) are for non-harmonised standardised products, while Model (3) and (4) are for harmonised standardised products. All of these models contain products that are controlled by mandatory statute. Model (5) to (8) are taking one-year lag of the Model (1)
 260 to (4), respectively.

Over all, our models do not fit very well, and significance level of each explanatory variable is relatively low, unfortunately. However, the estimation results of Model (5) and (6) for non-harmonised standardised products have a negative sign for the interaction term. Especially, Model (5) is statistically significant, while the estimation results of har-
 265 monised standardised products, such as Model (7) and (8), are not statistically significant. We could suggest that non-harmonised national standards with mandatory statutes in Japan would possibly deter the entrance of foreign products to Japanese market.

4 Conclusion

Standardisation has been deepening drastically since the effectuation of the WTO TBT
 270 agreement. It requires member countries to harmonise each national standard published in home market with a relevant international standard for a product. The harmonised national standards with international standards may reduce existing trade barriers of home market to foreign products and, thus, may improve foreign products' access to the home market. In contrast, the publication of national standards, which is not fully
 275 harmonised with its corresponding international standards, may increase the trade barrier

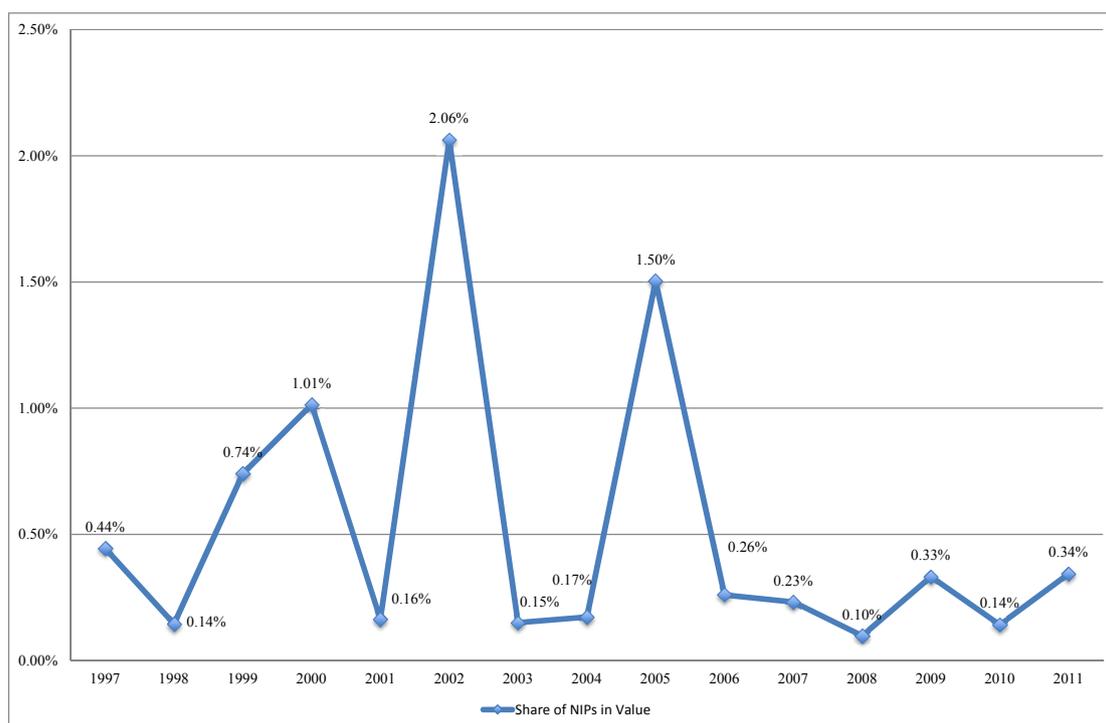


Figure 3 : The share of NIPs in Total Import Value in Japan
Source : Author's calculation using UN Comtrade Database

TABLE 3 – The Estimation results

	(1) Non-Harmonized products Mandatory Statute		(2) Harmonized products Mandatory Statute		(3) Non-Harmonized products Mandatory Statute One year lag		(4) Harmonized products Mandatory Statute One year lag	
	INT	CAP	INT	CAP	INT	CAP	INT	CAP
Ingdp	0.00288*** (7.27)	0.00314*** (5.59)	0.00233*** (11.76)	0.00236*** (10.79)	0.00298*** (7.55)	0.00261*** (4.92)	0.00146*** (8.89)	0.00204*** (10.10)
Indist	0.00347 (1.71)	0.000610 (0.21)	-0.000549 (-0.54)	0.000245 (0.22)	-0.00163 (-0.80)	-0.00149 (-0.55)	-0.000309 (-0.37)	-0.00102 (-0.99)
Treat	0.00368 (1.22)	-0.00749 (-1.16)	0.00103 (0.71)	0.00177 (0.51)	0.00791** (2.63)	0.00894 (1.46)	-0.00186 (-1.55)	-0.00231 (-0.72)
Year	0.00195 (0.52)	-0.0167 (-1.91)	0.000504 (0.29)	0.00531 (1.11)	0.00576 (1.54)	0.000223 (0.03)	0.00152 (1.04)	0.00295 (0.67)
Tyear	-0.00478 (-1.12)	0.0125 (1.36)	-0.00272 (-1.33)	-0.00623 (-1.27)	-0.00901* (-2.12)	-0.00395 (-0.45)	0.000169 (0.10)	-0.00215 (-0.47)
_cons	-0.0977*** (-5.13)	-0.0652* (-2.38)	-0.0469*** (-4.93)	-0.0567*** (-5.18)	-0.0564** (-2.96)	-0.0499 (-1.92)	-0.0290*** (-3.66)	-0.0348*** (-3.43)
N	8008	4368	22568	17108	8030	4380	22630	17155

t statistics in parentheses

==* p<0.05 ** p<0.01 *** p<0.001"

of the home market. Hence, non-harmonised national standards may serve as a deterrent to foreign products' access to the home market if the foreign country cites different standards from home country's one. In this regard, such standards harmonisation should be important as an international trade policy in that it would reduce the trade barriers across countries, and, thus, would affect international trade flows positively.

280 So far, not many preceding research papers have explored this research theme. We have had successfully an access to such standards' harmonisation information of Japanese national standards or JIS. In addition to the harmonisation of national standards, we also consider the effects of Japanese mandatory statutes, which require all home and foreign producers to cite JIS, on international trade. In case, the mandatorily cited JIS is not internationally harmonised, it does clearly cause trade barriers to foreign products in Japan. Using our concordance between HS 6-digit products in ISIC 29-35 and ISO/IEC international standards, the harmonisation information of JIS, and the data of mandatory statutes in Japan, we could have conducted the first ever empirical analysis of the effect of the standards harmonisation on international trade flows in Japan.

290 Our empirical results suggest that non-harmonised Japanese national standards with mandatory statutes would interfere the entrance of new foreign products into Japanese market. This result suggests that it is important for the WTO member countries to take an extra effort to harmonise its national standards with international standards in order to reduce trade barriers.

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