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EFFECT OF CREDIT RATING ON TRADE CREDIT: EMPIRICAL EVIDENCES FROM PAKISTANI NON-FINANCIAL FIRMS

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ABSTRACT

This study investigates the relationship between credit rating and trade credit transaction of non-financial firms in Pakistan. Buyers and suppliers moved from traditional trading systems to advancing automated and sophisticated business methods. Although non-financial firms have better access to the financial channel but still they are getting involved in trade credit to increase the market share. This study used panel data of non-financial firms of Pakistan. The data collected from the year 2008 to 2016 from 38 non-financial firms. By using fixed effect model, this study investigates that credit rating significantly affect the trade credit. This study finds that small-size non-financial firms use more trade credit as compared to large-size non-financial firms in Pakistan. Result suggests that large firms are less involve in trade credit because they are free from the problem of liquidity and access to the primary financial channel.

KEYWORDS: Trade Credit Supply, Trade Credit Demand, Credit Rating.

INTRODUCTION

Trade credit, is the supplier and buyer relationship which has become an essential part of today's business. Trade credit agreement is a process in which both parties (supplier and buyer) participate to fulfill the agreement. Due to fear/ problem of liquidity or shortage of investment, when customers become risky and unable to get help, they move towards other means of finance such as trade credit to fulfill their mutual interest. Medium and small sized firms face many limitations in getting the external finance (Berger and Udell 1995) [1]. According to Storey (1994) [2], the financial mix of UK firms indicated that trade credit is a source of finance for any firm but most preferable to medium and small sized firms. These days, many companies are using trade credit to fulfill the various business objectives, firms commonly decide to make the efficient use of capital. Marotta(1997) [15] stated that the importance of trade credit vary from country to country. As stated by Murfin and Njoroge (2012), [3] that the world's largest mart, the Wal-Mart is the largest user of trade credit. Wal-Mart prefers trade credit instead of borrowing from banks.

There are two major credit rating agencies are working in Pakistan.

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The first one is PACRA and second is JCR-VISE. Pakistan's non-financial sector suffers from loan regulation and trade credit is external financing source helps solve buyer liquidity problems. As a result, an increase in corporate credit ratings can increase the likelihood that a business acquires trade credit under simple terms and conditions. Here we will empirically examine the impact of corporate credit ratings on the trade credit supply and demand of non-financial companies in Pakistan.

Non-financial companies in Pakistan overcome the problem of default they maintain relationships with financial sector. According to Smith (1987) [4] banks have reduced credit limits for companies in Germany. However, the bank loans availability is considered a major issue for non-financial companies in Pakistan. There is a risk that the buyer company may not be able to obtain funds due to lack of funds. As risk increases, buyers need to find other convenient and less time-consuming external source of finance for business. Trade credit is the best way for companies where supplier already involved in business provides more help and support to businesses which are facing financial distress. Thus, the problem statement is "the use of trade credit has increased because of the high credit rating of nonfinancial firms".

RESEARCH QUESTIONS

- What is the impact of credit rating on trade credit supply and demand?
- Does the impact of credit rating is different for small and large size firms trade credit supply and demand?
- What is the combine effect of firm size and credit rating on trade credit?

RESEARCH OBJECTIVE

- To determine the relationship between credit rating and trade credit supply.
- To determine the relationship between credit rating and trade credit demand.
- To determine the relationship between credit rating and trade credit for small and large firms separately.
- To determine the combine relationship of credit rating and size (credit rating *size) for small and large firm trade credit.

For buyers and suppliers, trade credit is a good source of short-term financing. Trade credit used as a source of financing to effectively use resources and increase business sales. Supplier can easily assess the creditworthiness of the buyer through the credit rating developed by an independent third party. Trade credit agreements provide the best means to manage the way a business operates without disturbing other loan related issues. On other hand, buyers have the advantage that they do not have to face the problem of lending and can do credit transactions directly with the supplier.

LITERATURE REVIEW

According to Ferris (1981) [5] in trade credit theory, trade credit is a mean that used to reduce the attached cost to the transaction. Stated by Peterson and Rajan (1997) [6] in early 1990 the trade credit is an important segment of balance sheet of all American firms, 18 percent of total assets were recorded as account receivable. They find that large firms borrow and lend more trade credit. Larger firms prefer to borrow more although their cash flow are higher and fewer opportunities of growth. It indicates that they are more creditworthy. When financial institutions deny granting the credit then firms move to see another options and trade credit extensively used by firms (Petersen & Rajan, 1997) [6].

In Pakistan trade credit also an external source of finance most time for non-financial firms. According to Beck & Maksimovic (2008) [8], instability in financial market, the supplier and

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buyer make trade credit contract to fulfill their financial and business needs.

To resolve the problem of liquidity, small firms are more interested to issue the trade credit. Large companies show less interest in credit transactions, they not need to give the guarantee of their products (Long et al; 1993) [7]. According to Beck, Kunt & Maksimovic (2008) [8] as per the survey 48 countries of the world have 19.7 percent investments has been financed by trade credit as external source. Developed countries like UK and France more than 30 percent finance is trade credit as external source. Explained by Elliehausen and Wolken (1993) [9] that in US 60 percent of small firms use trade credit as a major financial source.

According to Berger, Udell (1995) [1] and Cunat (2006) [10] firms at beginning and younger firms mostly rely on trade credit as external source of finance. Suppliers offered them more helping hands and provide working capital financing to them. According to Cook (1999) [11] and Garcia (2010) [12] these offers enables the buyers to start a new era of trade and to form a new history of payments for their near future. According to Petersen and Rajan (1997) [6], large companies are giving more trade credit because these companies hold large amounts of accounts receivables. Large companies have more opportunities for properly managing the mechanism so that analysts can make more reliable transactions and records. These aspects lead to the company's huge financing.

A company's credit rating reflects the view of rating agency about the entity's overall credibility and ability to meet its financial obligations (S & P 2002) [14]. According to Shaheen and Yasmin Javid (2014) [13], credit rating agencies play a significant role in assessing the firm's risk of default. Credit rating agencies evaluate companies based on publicly available information. Credit ratings convey the view of credit rating agencies on the issuer's ability to pay its financial obligations. A good corporate credit rating is seen as a symbol of good quality, financial strength and sound reputation.

H1a: There is a significant relationship between large firm size and trade credit.

H1b: There is a significant relationship between small firm size and trade credit.

H2: There is and significant and positive relationship between credit rating and trade credit supply and demand.

METHODOLOGY

The population for this study consists of non-financial sector of Pakistan, listed at Karachi Stock Exchange. So, 38 non-financial firms are selected and data for credit rating taken by the PACRA and JCR-VIS credit rating agencies. The sample selected on the base of availability of data according to JCR-VIS and PACRA Credit Rating for non-financial firms. Both cross sectional and time series data is included in this research and data collected for nine years from the year 2008 to 2016. For analysis purpose (For research purpose this credit rating process already used by (Shaheen and Yasmin Javid, 2014) [13] and (Zeshan M), here weightage assigned to rating. AAA=1, AA+=0.95, and so on it ends at D=0.5

General equation of fixed effect model:

$$y_{it} = \alpha_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \cdots + \beta_k X_{kit} + \alpha_i + u_{it} \quad \text{---------- (1)}$$

As in our case specifically the model for trade credit can be written as follows

$$TC_{it} = \beta_0 + \beta_1 Size_{it} + \beta_2 CR_{it} + \beta_3 \left(\frac{Sales}{TA}\right)_{it} + \beta_4 logCGS_{it} + \beta_5 \left(\frac{INV}{TA}\right)_{it} + \beta_6 (RET/TA)_{it} + \beta_7 lnCash_{it} + \mu_{it} \quad \text{---------- (2}$$

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$$\left(\frac{AR}{Sales}\right)_{it} = \beta_0 + \beta_1 Lsize_{it} + \beta_2 CR_{it} + \beta_3 (CR * Lsize)_{it} + \beta_4 (INV/TA)_{it} + \beta_5 (SALES/TA)_{it} + \beta_6 (RET/TA)_{it} + \beta_7 \ln Liqudity_{it} + \alpha_i + u_{it} \quad (2.1)$$

$$\left(\frac{AR}{Sales}\right)_{it} = \beta_0 + \beta_1 SSize_{it} + \beta_2 CR_{it} + \beta_3 (CR * SSize)_{it} + \beta_4 (INV/TA)_{it} + \beta_5 (SALES/TA)_{it} + \beta_6 (RET/TA)_{it} + \beta_7 \ln Liquidity_{it} + \alpha_i + u_{it} \quad (2.2)$$

$$\left(\frac{AP}{Sales}\right)_{it} = \beta_0 + \beta_1 Lsize_{it} + \beta_2 CR_{it} + \beta_3 (CR * Lsize)_{it} + \beta_4 (INV/TA)_{it} + \beta_5 logCGS_{it} + \beta_6 (RET/TA)_{it} + \beta_7 \ln Liquidity_{it} + \alpha_i + u_{it} \quad (2.3)$$

$$\left(\frac{AP}{Sales}\right)_{it} = \beta_0 + \beta_1 SSize_{it} + \beta_2 CR_{it} + \beta_3 (CR * SSize)_{it} + \beta_4 (INV/TA)_{it} + \beta_5 logCGS_{it} + \beta_6 \left(\frac{RET}{TA}\right)_{it} + \beta_7 \ln Liquidity_{it} + \alpha_i + u_{it} \quad (2.4)$$

Where, Yit is dependent variable like accounts receivable and accounts payable. Xit's are independent variables. X explanatory variables as size of firm (lsize for large firms and SSize for small firms), assets turnover, inventory, and retained earnings, credit rating of non-financial firms, cost of goods sold, and cash. i represent different firms at time t. u represent error term.

RESULTS AND DISCUSSIONS

DESCRIPTIVE STATISTICS

Table 4.1 shows the descriptive statistics of all variable which are used in this study, the mean value of account receivable to sales is 0.180 and its standard deviation is 0.296. Account receivable to sales is used as proxy for trade credit supply. The maximum and minimum are 2.811 and 0.001. The average value of account payable to sales is 0.207 with the maximum and minimum of 5.271 and 0.008. Account payable is used as proxy of trade credit demand. Its standard deviation is 0.458. The mean value of CR is 0.799 and its standard deviation is 0.131. Its maximum and minimum are 1 and 0.050. The results show that maximum credit rating is AAA and minimum credit rating is D. The mean of sales to assets is 1.017 with maximum and minimum 2.948 and 0.194. Its standard deviation is 0.567. The mean of CGS is 9.466 with the maximum and minimum value of 13.805 and 2.782. Its standard deviation is 1.587. The mean value of inventory to assets is 0.153 with maximum and minimum value of 0.561 and 0.0007. Its standard deviation is 0.193. The mean value of retained earnings to assets shows the mean value of 0.303 with maximum and minimum of 0.769 and 0.0003 and its standard deviation is 0.409. The mean value of cash is 5.729 with the maximum and minimum of 9.849 and 0.1337 and its standard deviation is 2.506.

Table 1.Descriptive Statistics

	ACR	ACP	CRL	A. T	CGS	INV	RET	LIQ
Mean	0.180	0.207	0.799	1.017	9.466	0.153	0.303	5.759
Median	0.084	0.132	0.800	0.999	9.503	0.107	0.222	5.332
Maxim.	2.811	5.271	1.000	2.948	13.805	0.561	0.769	13.463
Minim.	0.001	0.008	0.050	0.194	2.782	0.0007	0.0003	0.133
Std.D.	0.296	0.458	0.131	0.567	2.782	0.193	0.409	2.506

CORRELATION ANALYSIS

Table 2 shows the Pearson correlation test adopted to explain the direction of the relationship. Credit rating shows the positive relationship with trade credit supply and demand.

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Table 2.Correlation analysis

	ACR	ACP	CR	A.T	LIQ.	INV	RET	CGS
ACR	1							
ACP	0.4050	1						
CR	0.1139	0.0586	1					
A.T	0.0860	0.1186	.1225	1				
LIQ	-0.0806	0.0874	.3375	.1223	1			
INV	-0.1423	-0.0532	-.0065	.6909	-.0287	1		
RET	-0.0880	-0.0818	.0957	.5767	-.0236	.6609	1	
CGS	-0.1335	-0.0943	.2937	.2109	.7644	.07955	.01342	1

UNIT ROOT TEST

For unit root detection, Levin, Lin and Chu (2002) and Im, Pesran and Shin (2003) has been applied. The results of unit root test are reported in the following table 3 Results reported are indicating that unit root does not exist in any of the variable or the series are stationary at level.

Table 3.Unit Root Test

	Levin, Lin & Chu t*		Im, Pesaran and Shin W-stat	
Variables	**Statistic**	**Prob.**	**Statistic**	**Prob.**
ACR	-31.6392	0.0000	-3.88869	0.0001
A.T	-91.5806	0.0000	-15.0329	0.0000
RET	-14.7395	0.0000	-2.93404	0.0017
INV	-36.5333	0.0000	-8.48959	0.0000
Cash	-34.8231	0.0000	-6.26292	0.0000
ACP	-99.0661	0.0000	-13.2877	0.0000
CGS	-6.92195	0.0000	-2.66970	0.0038

The Hausmen test is applied to decide between fixed effect and random effect model. The p value of cross-section random is (0.0087). In case of trade credit demand, the p-value of cross-section random is (0.0005). Which is less than <0.05 indicating that fixed effect model will be applied.

FIXED EFFECT RESULTS FOR SUPPLY SIDE

Table 4.Large size firms credit supply and credit rating

	Fixed Effect (Large firms)		
Variable	**Coefficient**	**t-statistic**	**Prob.**
C	-0.8547	-1.6350	0.1035
Size	1.0330	1.9986	0.0469
CR.	1.3925	2.1215	0.0350
Size*CR	-1.4301	-2.1906	0.0296
AT.	0.0683	3.5342	0.0005
RET.	-0.3776	-4.4123	0.0000
INV.	0.4518	2.1759	0.0307
CASH	-0.0091	-0.8012	0.4238
R-square			0.5838

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Adj. R-square			0.5001
F-statistic			6.9814
Prob(F-statistic			0.0000
Durbin-Wat. S.			1.6868

Table 4 explains the relationship between credit rating and trade credit supply for large size firms. In this model asset turnover (AT), retained earnings (RET), cash and bank balance (Cash) inventory (INV) as control variable. Large size firms have coefficient value is (1.0331) their p-value is (0.0469) significant which is less at the level of (p≤0.05). It means large size firms offer more trade credit to their customers. Credit ratings of firms have significant p-value (0.0350) with its coefficient value (1.3926). It means when credit rating of firms increase, it leads to increase in trade credit supply by firms. The result of interaction term (combine effect of firm size and credit rating) (LSIZE*CR) show that its p-value is (0.0296) significant and coefficient values is (-1.4302). It indicates if 1 percent variation occurs in credit rating, trade credit supply by large firms will change -1.4302 in opposite directions. It means large firms offers less trade credit to other firms because they have no liquidity problem. So according to research objective (LSize *CR) the combine effect of credit rating and size on trade credit is negative.

The p-value of asset turnover is significant at the level of (p≤0.05) coefficient value is (0.0683). It implies that trade credit supply and sales move in same direction. When sales increase, trade credit also increases. So, third hypothesis is accepted. Retained earnings has negative coefficient value (-0.3776) with p-value is (0.0000) which is significant. It means firms use external finance only when internal funds are insufficient.

Inventory to assets ratio has a positive coefficient (0.4519) with p-value is (0.0307) which is significant. As the firm piles up inventory, they become more able to offer trade credit and thus offer to companies that have suffered a negative impact on sales. Inventory management is thus an important motive for firms to offer the trade credit to other firms.

Table 5.Small size firms credit supply and credit rating

	Fixed Effect (Small firms)		
Variable	**Coefficient**	**t-statistic**	**Prob.**
C	0.1783	1.1421	0.2547
Size	-1.0330	-1.9986	0.0469
CR.	-0.0376	-0.2162	0.8290
Size*CR	1.4301	2.1906	0.0296
AT.	0.0683	3.5342	0.0005
RET.	-0.3776	-4.4123	0.0000
INV.	0.4518	2.1759	0.0307
CASH	-0.0091	-0.8012	0.4238
R-square			0.5838
Adj. R-square			0.5001
F-statistic			6.9814
Prob(F-statistic			0.0000
Durbin-Wat. S.			1.6868

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The R-squared value shows that 58.38% of variation occurred in trade credit (dependent variable) are explained by independent variables credit rating.

Relationship between Credit Rating and Trade Credit supply for Small-sized firms is explained in table 5. In this model asset turnover (AT), retained earnings (RET), cash and bank balance (Cash) inventory (INV) as control variable. Small size firms have coefficient value is (-1.0331) their p-value is (0.0469) significant which is less at the level of (p≤0.05). It means, there is a positive relationship between trade credit supply and small size firms. A credit rating of firms has negative coefficient value (-0.0376) with its p-value (0.8290) is insignificant. The result of interaction term (combine effect of firm size and credit rating) (SSIZE*CR) show that its p-value is (0.0296) significant and coefficient values is (1.4302). It means small sized firms are more interested in trade credit. It means small firm offers more trade credit to their customers. So according to research objective (SSize *CR) the combine effect of credit rating and size on trade credit is positive.

The p-value of asset turnover is significant at the level of (p≤0.05) coefficient value is (0.0683). It implies that trade credit supply and sales move in same direction. When sales increase, trade credit also increases. So, third hypothesis is accepted. Retained earnings has negative coefficient value (-0.3776) with p-value is (0.0000) which is significant. It means firms use external finance only when internal funds are insufficient.

Inventory to assets ratio has a positive coefficient (0.4519) with p-value is (0.0307) which is positive and significant. As the company piles up inventory, they become more able to offer trade credit and thus offer to companies that have suffered a negative impact on sales. Inventory management is thus an important motive for firms to offer the trade credit to other firms.The R-squared value shows that 58.38% of variation occurred in trade credit (dependent variable) are explained by independent variables Credit Rating.

FIXED EFFECT RESULTS FOR DEMAND SIDE

Table 6.Large size firms credit demand and credit rating

	Fixed Effect (large firms)		
Variable	**Coefficient**	**t-statistic**	**Prob.**
C	-0.6179	-0.6688	0.5043
Size	1.5245	1.7587	0.0800
CR.	2.0407	1.8256	0.0693
Size*CR	-2.0954	-1.9002	0.0587
CGS.	-0.0861	-2.5992	0.0100
RET.	-0.6116	-4.1644	0.0000
INV.	1.4604	4.1594	0.0000
CASH	0.0162	0.6864	0.4931
R-square			0.3968
Adj. R-square			0.2783
F-statistic			3.3504
Prob(F-statistic			0.0000
Durbin-Wat. S.			1.6331

Table 6 explains the relationship between credit rating and trade credit demand for large sized firms. In this model asset turnover (CGS), retained earnings (RET), cash (Cash) inventory

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(INV) as control variable. Large size firms have coefficient value is (1.5245) with p-value is (0.0800) significant which is significant at the level of (p≤0.10). It means large size firms and trade credit demand have positive relationship. A credit rating of firms has significant p-value (0.0693) with its coefficient value (2.0408). It means when credit rating of firms increase, it leads to increase in trade credit demand by firms. The result of interaction term (combine effect of firm size and credit rating) (LSIZE*CR) show that its p-value is (0.0587) significant and coefficient values is (-2.0954). It indicates if 1 percent variation occurs in credit rating, trade credit supply by large firms will change -2.0954 in opposite directions. It means large firms are less involved in trade credit demand. So according to research objective (LSize *CR) the combine effect of credit rating and size on trade credit is negative.

Retained earnings has negative coefficient value (-0.6117) with p-value is (0.0000) which is significant. It means firms use external finance only when internal funds are insufficient. Inventory to assets ratio has a positive coefficient (1.4604) with p-value is (0.0000) which is significant. Inventories are easy to liquidate from supplier point of view. So when this ratio is high, suppliers have advantage over financial institutions and he will be willing to offer trade credit.

The R-squared value shows that 39.68% of variation occurred in trade credit (dependent variable) are explained by independent variables Credit Rating.

Table 7.Small size firms credit demand and credit rating

	Fixed Effect (small firms)		
Variable	**Coefficient**	**t-statistic**	**Prob.**
C	0.9066	2.3831	0.0180
Size	-1.5245	-1.7587	0.0800
CR.	-0.0546	-0.1715	0.8639
Size*CR	2.0954	1.9002	0.0587
CGS.	-0.0861	-2.5992	0.0100
RET.	-0.6116	-4.1644	0.0000
INV.	1.4604	4.1594	0.0000
CASH	0.0162	0.6864	0.4931
R-square			0.3968
Adj. R-square			0.2783
F-statistic			3.3504
Prob(F-statistic			0.0000
Durbin-Wat. S.			1.6331

Table 7 explains the relationship between credit rating and trade credit demand for Small-sized firms. In this model asset turnover (AT), retained earnings (RET), cash and bank balance (Cash) inventory (INV) as control variable. Small-size firms coefficient value is (-1.5245) their p-value is (0.0800) significant at the level of (p≤0.10). It means, there is a positive relationship between trade credit demand and small-sized firms. A credit rating of firms has negative coefficient value (- 0.0547) with its P-value (0.8639) is insignificant. The result of interaction term (combine effect of firm size and credit rating) (SSIZE*CR) show that its p-value is (0.0587) significant and coefficient values is (2.0954). It means small sized firms are more interested in trade credit. It means small firms demand more trade credit. So according to research objective

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(SSize *CR) the combine effect of credit rating and size on trade credit is positive.

Retained earnings has negative coefficient value (-0.6117) with p-value is (0.0000) which is significant. It means firms use external finance only when internal funds are insufficient. Inventory to assets ratio has a positive coefficient (1.4604) with p-value is (0.0000) which is significant. Inventories are easy to liquidate from supplier point of view. So when this ratio is high, suppliers have advantage over financial institutions and he will be willing to offer trade credit.

The R-squared value shows that 39.68% of variation occurred in trade credit (dependent variable) are explained by independent variables Credit Rating.

CONCLUSION

This research study strives to capture the impact of credit rating on trade credit supply and demand. Past research has explained much about trade credit, but there is no such thing as the effect of credit rating on trade credit as per nonfinancial firms of Pakistan is concerned. Therefore, the study examined the impact of credit ratings on trade credit usage to provide enhanced picture of trade credit. Trade credit contracts give the ultimate way of business operation. On the other hand, the buyer has the advantage of not facing any discomfort as the supplier is already involved in the same business and can make direct use of the supplier credit facilities. Bank loans becomes complex and loan collateral can be troublesome for the buyer. Risky buyers have a better chance of using discounted loans from the same supplier already involved in the supply of goods.

This study explored the effect of credit rating on trade credit of non-financial firms of Pakistan. 38 non-financial firm's annual financial data for the period of 9 years (2008 to 2016) has been used for analysis purpose. Trade credit plays an important role for firms as source of finance. Those firms that are financially constrained, they can get the funds in the form of trade credit from supplier to maintain their business operation. Those firms that have higher credit rating they can get supplies on cash. Creditworthy firms financially less constrained as result they can get finance from the formal financial institutions like bank. Small non-financial firms are more interested in trade credit. Small firms have financial limitations. Therefore they use the trade credit as an alternative of financial source.

As well as this study have practical implications it also have some limitations and unobserved factors. First of all this study only takes into account non-financial firms which are listed at Pakistan stock exchange that public their financial information on regular basis. Furthermore, this study only limited to non-financial sector of Pakistan and results can't be generalized over all Pakistani industries.

This study is based on limited to the selected developing country (Pakistan). It recommended that many other countries should be selected for trade credit and credit rating. So the study uses the annual data of non-financial firms for the effect of credit rating on trade credit and also countries can be used for future research. The time frame for research work, include the nine years from 2008 to 2016, this time period can be increased by nine years for more accurate results. The empirical support for research in the context of Pakistan has inspired further innovations in research in this area and can be applied to other countries.

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