RESEARCH ARTICLE

Do Trade Restrictions or Openness Affect Economic Growth Differently in the Presence of Export Credits?

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Abstract

This paper looks at the impact of trade barriers and trade openness on economic growth in the presence of export credits. A panel data analysis of 90 non-Organisation for Economic Co-operation and Development (OECD) countries, which are recipients of export credit is conducted and the impact of trade restrictions and trade openness on economic growth over three decades is investigated. The results show no evidence of any change in the impact of trade restriction on economic growth but a positive and significant impact of trade openness on economic growth in the presence of export credits.
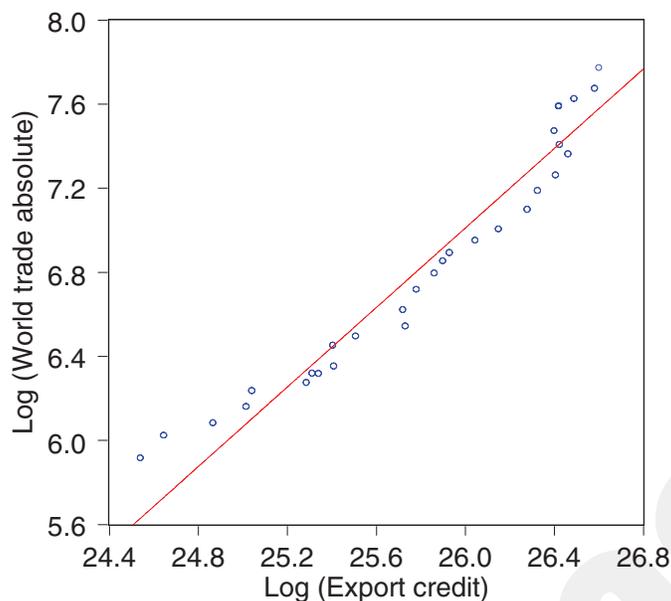
Keywords: Export credits; trade; economic growth.

1. Introduction

In this paper, I intend to investigate if trade barriers or trade openness have different impacts on economic growth in the presence of export credits. Export credits are government financial support, direct financing, guarantees, insurance or interest rate support provided to foreign buyers to assist in the financing of the purchase of goods from national exporters. The main purpose of export credits, therefore, is to promote exports of the home country by providing financial guarantees against payment defaults of foreign importers (For more on this, see Demirguc-Kunt and Erzan [1]). Using export credits has three important advantages. First, they promote the trade with almost 8% of global trade covered by such credits, they outweigh the amount of development aid, traditional private investment and other cash flows from developed to developing countries [2]. Many studies have shown the positive impact of export credits on the volume of trade. For example, Egger and Url [3] showed a robust and sizable long-term effect of export credits issued by the Organisation for Economic Co-operation and Development (OECD) countries on the volume of their exports. In a theoretical and empirical study, Rienstra-Munnicha and Turvey [4] showed a positive relationship between export credits granted by USA, Canada and Australia and the volume of exports. Chen [5] and Kohlscheen and O'Connell [6] also found a positive relationship between export credits and the volume of export. Figure 1 shows a high correlation (0.97) between global export credits[1] and world trade over the period 1975–2005. Second, there are no trade liberalization requirements attached to the granting of export credits. In other words, the country to which an exporter exports the goods is not required to lower its trade barriers or make any other changes in them. This fact is especially relevant to our discussion as we are interested in finding out whether access to export credits causes unchanging import restrictions to have a different effect on economic growth. Third, most export

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[1]For a list of recipient countries, see Appendix A.

Figure 1: Scatter plot of world trade and export credit.

credits are given by developed countries to developing countries so that the latter can import from the former. If trade with developed countries helps economic growth in developing countries and export credits increase the trade between the two, then export credits can affect growth in developing as well as developed countries.

This paper will consider whether trade restrictions or trade openness affect growth differently in the developing countries that receive export credits. For example, countries receiving export credits could have more potential to trade and so any restrictive effect from tariffs could be more potent. On the other hand, if tariffs do not lower the growth when export credits are large, then perhaps countries could use tariffs as a source of government revenue without facing more severe negative effects on growth. These findings could hold important policy implications. If a developing country wishes to maintain or increase its economic growth via trade with a developed one and at the same time needs to raise revenue by imposing trade duties, it can do so without sacrificing one for the other.

I have selected non-OECD countries[2] in addition to Mexico and Turkey because their average Gross Domestic Product (GDP) per capita for most of the period under study is lower than those of several countries in the sample. Major oil-producing countries and former or present socialist countries are excluded. Oil-producing countries are excluded because they generate most of their GDP from natural resources rather than value added (see Mankiw *et al.* [7] and Barro [8]). Socialist or formerly socialist countries are excluded because a great majority of them did not have a free market economy for about two-thirds of the period under study in this paper. In this paper, the impact of trade restriction and openness on economic growth in the presence of export credits is reported.

1.1. On export credits

There are two categories of countries that are eligible to receive "export credits" (For more details, see *Arrangement on Officially Supported Export Credits*, The OECD [9] Category I are those countries whose per capita Gross National Income (GNI) has been for at least two consecutive years

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[2]For a list of these countries, see Appendix B.

above the World Bank graduation threshold (i.e. per capita GNI more than $5685 for 2004 and more than $6055 for 2005). Category II countries are all the others. Category I countries have a repayment period of 5 years and category II countries have a repayment period of 10 years. There is also a country risk factor based on political, legislative or any other conditions that will render repayment of funds borrowed under export credit difficult or impossible. There are 0–7 categories of countries in an ascending order of risk. The riskier is a country the higher will be the minimum premium rate, which is the rate charged to borrowers.

The fact that export credits affect a country's access to world trade and are a time-varying variable allows one to see to what extent the effects of trade restrictions or openness on economic growth vary by a country's potential for trade.

2. Methods

The model:

$$GDPPCGR_{it} = \beta_1 \log(IGDPPC)_{i,t} + \beta_2 SCH_{it} + \beta_3 \log(TEL_{it}) + \beta_4 TR_{it} + \beta_5 \log(EXCPC_{it}) + \beta_6 TR_{it} \times \log(EXCPC_{it}) + a_t + \eta_i + \varepsilon_{it}$$

$GDPPCGR_{it}$ is the per capita GDP growth rate averaged over each sub-period (1970–1979, 1980–1989 and 1990–1999). IGDPPC is the initial GDP per capita in the first year of each sub-period (1970, 1980 and 1990). SCH is a measure of human capital averaged over each sub-period proxied by the percentage of population with a secondary school education. TEL is a measure of initial physical capital in the first year[3] of each sub-period proxied by the number of telephone main lines per 1000 people. Telephone mainlines are indicators of communication infrastructure in an economy. See, for example, Rogers [10]. Communication infrastructure is not only vital for economic growth but it has been shown to play a more important role than variations in tariffs in the propensity of a country to trade François and Manchin [11]. Telephone mainlines are a key development indicator according to the World Bank Atlas [12]. Furthermore, they have been used as proxies for physical capital in other studies. See, for example, Yanikkaya [13] and Butkiewicz and Yanikkaya [14]. TR is the trade restriction averaged over each sub-period. For trade restriction, I used the ratio of import duties over imports and the Sachs–Warner (SW) index of openness. The SW trade liberalization index updated by Wacziarg and Welch [15] is based on five criteria of trade restriction: (1) non-tariff barriers covering 40% or more of trade; (2) average tariff rates of 40% or more; (3) a black market exchange rate that is depreciated by 20% or more relative to the official exchange rate; 4) a socialist economic system; (5) a state monopoly on major exports. A country is considered "open" if it meets none of the five criteria in which case it receives a value of 1. A country is considered "closed" if it meets any one criterion in which case it receives a value of 0. EXCPC is export credit per capita averaged in the same way. Export credits enter the model both individually and interactively with trade restrictions. They enter the model individually to capture the direct effect of export credits on growth. Export credits enter the model interactively with trade restrictions to capture the impact of the latter on growth in the presence of export credits. Investigation of this impact is, of course, the main focus of this paper, a_t and η_i are fixed effects and ε_{it} is the disturbance term.

3. Results and Discussion

Using ordinary least squares (OLS), I obtained estimates with and without the inclusion of period fixed effects (but always included cross-section fixed effects). The results using both cross-section

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[3]Due to data limitation and for the 1970–1979 sub-period, the year 1975 was taken as the first year for this variable.

and period fixed effects are reported in Table 1. In Equation (1), trade restriction is significant at 10% and has a positive coefficient. This result is not necessarily surprising. There are a number of studies that have found similar positive relationship. For example, Yanikkaya [13] finds a positive relationship between tariffs and economic growth. Nunn and Trefler [16] conclude that tariff protection in skilled industries can have a beneficial effect on economic growth. In a theoretical model, Shun-Fa [17] shows that higher import tariffs can boost economic growth under certain conditions. Export credit per capita has an insignificant coefficient. Although export credit seems to affect trade as evidenced by studies cited above as well as Figure 1 but its direct impact on economic growth is less clear. Export credit and economic growth have a very weak positive correlation at only 0.023. The correlation between the two is also shown in Figure 2.

In Equation (2), where trade restriction and export credit are interacted, the coefficients for trade restriction, export credit per capita and the interactive term between the two are all insignificant. It should be noted that the R^2 for both Equations (1) and (2) is 0.79 which, given the fact that the model contains cross-sectional data, is a fairly strong number, pointing to the absence of model

Table 1: Interactive effects of import tariffs and export credits on per capita GDP growth; panel data (1970–1999).

	Equation (1)	**Equation (2)**
C	53.88 (0.00)	53.63 (0.00)
Log(IGDPPC)	−7.31 (0.00)	−7.31 (0.00)
Log(SCH)	−0.48 (0.55)	−0.47 (0.56)
Log(TEL)	1.54 (0.12)	1.54 (0.13)
TR	0.09 (0.08)	0.11 (0.77)
Log(EXCPC)	0.07 (0.94)	0.09 (0.93)
TR × Log(EXCPC)	–	−0.00 (0.97)
R^2	0.79	0.79
Number of countries	68	68
Number of observations	145	145

Both cross-section and period fixed effects are used.
P-values are given within parentheses.
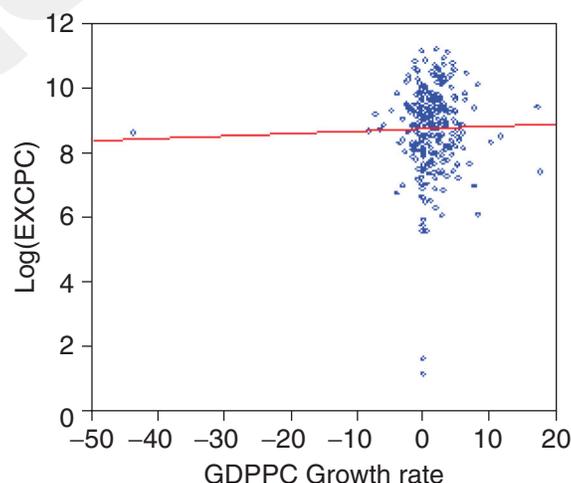
Figure 2: Scatter plot of growth rate of GDPPC and log of export credit per capita.

misspecification. Table 2 shows the results of the estimation where only cross-sections fixed effect has been used. Once again, the coefficients of interest are not significant and R^2 at 0.75 is now lower than in Table 1, indicating that the model where both cross-section and period fixed effects have been used has somewhat of a stronger explanatory power.

Next I replaced the import tariffs with the SW openness index[4]. Table 3 shows the results where both cross-section and period fixed effects have been used and Table 4 shows the result where only cross-section fixed effect has been used. In Equation (1), in both tables, SW has a positive coefficient and is significant (at 10% in Table 3 and at 5% in Table 4). This result is in line with many other studies, finding the positive impact of the SW index on economic growth. See, for example, Sachs and Warner [18], Wacziarg and Welch [19] and Clemens and Williamson [20, 21] among others. In Equation (2), in both tables, the interactive term between SW and log of export credit is positive and significant at 5%. This is an important result showing that export credit will have a positive impact on economic growth if the economy is open to trade. It is plausible to assume that the positive impact of export credit on the recipient country's economy, as shown in Tables 3 and 4, is

Table 2: Interactive effects of import tariffs and export credits on per capita GDP growth; panel data (1970–1999).

	Equation (1)	Equation (2)
C	45.33 (0.00)	41.14 (0.00)
Log(IGDPPC)	−6.22 (0.00)	−6.27 (0.00)
Log(SCH)	0.20 (0.81)	0.25 (0.77)
Log(TEL)	3.23 (0.00)	3.24 (0.00)
TR	0.09 (0.14)	0.44 (0.26)
Log(EXCPC)	−0.09 (0.88)	0.36 (0.65)
TR × Log(EXCPC)	–	−0.04 (0.35)
R^2	0.75	0.75
Number of countries	68	68
Number of observations	145	145

No period fixed effect, only cross-section fixed effect is used.
P-values are given within parentheses.

Table 3: Interactive effects of SW and export credits on per capita GDP growth; panel data (1970–1999).

	Equation (1)	Equation (2)
C	26.31 (0.02)	35.67 (0.00)
Log(IGDPPC)	−4.40 (0.00)	−4.86 (0.00)
Log(SCH)	0.16 (0.84)	0.81 (0.35)
Log(TEL)	0.46 (0.65)	0.18 (0.86)
SW	1.23 (0.07)	−9.90 (0.71)
Log(EXCPC)	0.60 (0.54)	−0.24 (0.83)
SW × Log(EXCPC)	–	1.81 (0.04)
R^2	0.71	0.72
Number of countries	58	58
Number of observations	141	141

Both cross section and period fixed effects are used.
P-values are given in parenthesis.

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[4]Due to data availability for SW index, the countries for which this index was used are different from the ones for which import tariffs were used. For a list of these countries, see Appendix C.

via increased import. To test this assumption, I first regressed the log of import per capita on log of export credit per capita, keeping the same control variables. The results, shown in Table 5, indicate a significant (at 5%) and positive coefficient for the log of export credit per capita with a very strong R^2 of 0.96. The correlation between the two is a strong 0.73 (see also Figure 3 below). Next, I regressed

**Table 4:** Interactive effects of SW and export credits on per capita GDP growth; panel data (1970–2009).

	Equation (1)	Equation (2)
C	24.6 (0.00)	28.97 (0.00)
Log(IGDPPC)	−3.54 (0.01)	−3.85 (0.00)
Log(SCH)	0.32 (0.69)	1.12 (0.19)
Log(TEL)	1.16 (0.24)	0.79 (0.42)
SW	1.79 (0.00)	−9.70 (0.70)
Log(EXCPC)	−0.19 (0.77)	-0.62 (0.36)
SW × Log(EXCPC)	–	1.22 (0.03)
R^2	0.69	0.70
Number of countries	58	58
Number of observations	141	141

No period fixed effect, only cross section fixed effect is used.
P-values are given in parenthesis.

Table 5: Regression of log of import per capita on log of export per capita.

C	−6.14 (0.00)
Log(IGDPPC)	0.97 (0.00)
Log(SCH)	−0.32 (0.09)
Log(TEL)	−0.07 (0.72)
Log(EXCPC)	0.64 (0.00)
R^2	0.96
Number of countries	48
Number of observations	116

P-values are given in parenthesis.
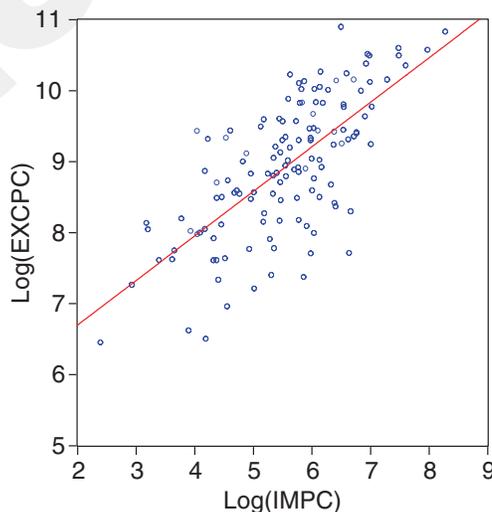
Figure 3: Scatter plot of log of import per capita and log of export credit.

Table 6: Regression growth rate of GDP per capita on log of import per capita.

C	34.91 (0.00)
Log(IGDPPC)	−5.60 (0.00)
Log(SCH)	0.28 (0.77)
Log(TEL)	0.49 (0.65)
Log(IMPC)	1.14 (0.07)
R^2	0.72
Number of countries	49
Number of observations	119

P-values are given in parenthesis.

the growth rate of GDP per capita on log of import per capita, again keeping the same control variables. Results are shown in Table 6. As can be seen the coefficient for the log of import per capita is positive and significant at 10%. Based on these results, it would be reasonable to conclude that the positive impact of the interaction between trade openness, as measured by SW index, and export credit on economic growth is due to increased import.

4. Conclusion

The results obtained above provide no evidence that export credits cause tariffs to affect economic growth differently in developing countries. However, when it comes to trade openness, the picture changes. Export credits do have a positive and significant impact on economic growth when they are interacted with the SW index. As was discussed above, this positive impact is most likely due to the positive impact of increased import by the recipient countries on their economic growth. This has important policy implications both for the recipients of export credits as well as those countries that grant them. Both trading partners will benefit from extension of these credits. Recipient countries benefit through the positive impact of increased import on their economic growth and the granting countries benefit as more exports increase their total real GDP.

Competing Interests
None declared.

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Appendix A: Recipients of export credits.

Albania	Gambia, The	Panama
Algeria	Georgia	Papua New Guinea
Angola	Ghana	Paraguay
Argentina	Grenada	Peru
Armenia	Guatemala	Philippines
Azerbaijan	Guinea	Poland
Bangladesh	Guinea-Bissau	Romania
Barbados	Guyana	Russian Federation
Belarus	Haiti	Rwanda
Belize	Honduras	Samoa
Benin	Hungary	Sao Tome and Principe
Bhutan	India	Senegal
Bolivia	Indonesia	Serbia and Montenegro
Bosnia and Herzegovina	Iran, Islamic Republic	Seychelles
Botswana	Jamaica	Sierra Leone
Brazil	Jordan	Slovak Republic
Bulgaria	Kazakhstan	Solomon Islands
Burkina Faso	Kenya	Somalia
Burundi	Kyrgyz Republic	South Africa
Cambodia	Lao PDR	Sri Lanka
Cameroon	Latvia	St. Kitts and Nevis
Cape Verde	Lebanon	St. Lucia
Central African Republic	Lesotho	St. Vincent and the Grenadines
Chad	Liberia	Sudan
Chile	Lithuania	Swaziland
China	Macedonia, FYR	Syrian Arab Republic
Colombia	Madagascar	Tajikistan
Comoros	Malawi	Tanzania
Congo, Democratic Republic	Malaysia	Thailand
Congo, Republic	Maldives	Togo
Costa Rica	Mali	Tonga
Cote d'Ivoire	Mauritania	Trinidad and Tobago
Croatia	Mauritius	Tunisia
Djibouti	Mexico	Turkey
Dominica	Moldova	Uganda
Dominican Republic	Mongolia	Ukraine
Ecuador	Morocco	Uruguay
Egypt, Arab Republic	Mozambique	Uzbekistan
El Salvador	Myanmar	Vanuatu
Equatorial Guinea	Nepal	Venezuela, RB
Eritrea	Nicaragua	Vietnam
Estonia	Niger	Yemen, Republic
Ethiopia	Nigeria	Zambia
Fiji	Oman	Zimbabwe
Gabon	Pakistan	

Appendix B: Non-OECD countries for which import tariffs were used.

Argentina	Fiji	Peru
Bangladesh	Gabon	Philippines
Barbados	Gambia, The	Rwanda
Belize	Grenada	Samoa
Benin	Guatemala	Sao Tome and Principe
Bhutan	Guinea	Senegal
Bolivia	Guinea-Bissau	Seychelles
Botswana	Guyana	Sierra Leone
Brazil	Haiti	Solomon Islands
Burkina Faso	Honduras	Somalia
Burundi	India	South Africa
Cameroon	Indonesia	Sri Lanka
Cape Verde	Kenya	St. Kitts and Nevis
Central African Republic	Lebanon	St. Lucia
Chad	Lesotho	St. Vincent and the Grenadines
Chile	Liberia	Sudan
Colombia	Madagascar	Swaziland
Comoros	Malawi	Syrian Arab Republic
Congo, Republic	Malaysia	Tanzania
Costa Rica	Mauritania	Thailand
Cote d'Ivoire	Mauritius	Togo
Djibouti	Mexico	Tonga
Dominica	Morocco	Trinidad and Tobago
Dominican Republic	Mozambique	Tunisia
Ecuador	Nepal	Turkey
Egypt, Arab Republic	Niger	Uganda
El Salvador	Pakistan	Uruguay
Equatorial Guinea	Panama	Vanuatu
Eritrea	Papua New Guinea	Zambia
Ethiopia	Paraguay	Zimbabwe

Appendix C: Non-OECD countries for which SW index was used.

Argentina	Ethiopia	Pakistan
Bangladesh	Gambia, The	Papua New Guinea
Barbados	Guatemala	Paraguay
Benin	Guinea	Peru
Bolivia	Guinea-Bissau	Philippines
Botswana	Guyana	Sierra Leone
Brazil	Haiti	South Africa
Burkina Faso	Honduras	Sri Lanka
Burundi	India	Syrian Arab Republic
Cameroon	Indonesia	Thailand
Central African Republic	Kenya	Togo
Chad	Madagascar	Trinidad and Tobago
Chile	Malawi	Tunisia
Colombia	Malaysia	Turkey
Congo, Republic	Mauritania	Uganda
Costa Rica	Mauritius	Uruguay
Dominican Republic	Mexico	Zambia
Ecuador	Morocco	Zimbabwe
Egypt, Arab Republic	Nepal	
El Salvador	Niger	