

# Economic Growth, Globalization, and Poverty in Taiwan: Evidence After Economic Liberalization

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The purpose of this paper is to examine how economic growth and economic globalization contribute to poverty alleviation in Taiwan after its economic liberalization. This is the first study to investigate the separate impacts of export and import on poverty in Taiwan. Their distinct impacts highlight the importance for the Taiwanese government to shape trade strategies to boost export. This study is also the first to provide evidence showing the adverse influence of capital liberalization on poverty in Taiwan. The negative impact signifies that the warning with regard to the distributional effect of globalization may not be baseless.

*Keywords:* Taiwan, globalization, export, import, foreign direct investment, poverty

The impact of economic globalization, as usually confined to international trade in goods and international investment of capital (Harrison, 2007; Huang, Teng, & Tsai, 2010), on poverty is a key area of debate both in academic and in political circles (Jenkins, 2005). The proglobalization group insists that globalization would accelerate economic growth and thus reduce poverty (J. Bhagwati & Srinivasan, 2002; J. N. Bhagwati, 2004; Dollar & Kraay, 2002, 2004). In other words, the proponents believe in the Bhagwati hypothesis in which growth is the principal driver of poverty reduction no matter where growth comes from (J. Bhagwati & Srinivasan, 2002; J. N. Bhagwati, 2004; Srinivasan & Bhagwati, 1999; Tsai & Huang, 2007). The opponent group, on

the other hand, emphasizes that globalization-led growth may not be propoor because it usually deteriorates income distribution (Easterly, 2007; Stiglitz, 2002; Wade, 2004). This group, notably from nongovernmental organizations (NGOs) and street protestors, argued that the wrong kind of growth fails to help the poor and benefits only the middle and upper classes (Tsai & Huang, 2007).

Due to the importance of the debate, the purpose of this paper is to investigate the globalization–growth–poverty nexus in Taiwan. The country-specific study approach is adopted because cross-country regressions averaging across the diversity of initial conditions of studied countries can distort systematic patterns of the globalization–growth–poverty nexus (Harrison, 2006; Ravallion,

2001) and panel regressions pooling countries with different time series properties in respect of the relationships being observed can give misleading results (Lloyd, Morrissey, & Osei, 2001). Taiwan is chosen as its experience offers itself as being a particularly interesting case for studying the impact of economic globalization on poverty (Tsai & Huang, 2007). In particular, Taiwan's experience exhibits a close link among globalization, growth, and poverty change. In fact, due to this feature, Tsai and Huang (2007) have examined the link during the period from 1964 to 2003. Following their study, this study reexamines the globalization-growth-poverty nexus in Taiwan. This study is different from theirs and other existing studies at least in two important aspects.

First, this study explores the impacts of export and import separately. The existing relevant studies, such as Dollar and Kraay (2004), Tsai and Huang (2007), and Huang et al. (2010), focused exclusively on the impact of the entire international trade. This implicitly imposes an equality constraint on the impacts of import and export. However, the different nature between import and export warrants a separate treatment with respect to their impacts on poverty. Particularly, Goldberg and Pavcnik (2007) showed that increasing import competition increases the probability of unemployment of individuals in related sectors in Columbia, while export growth does not have significant influence. To the best of our knowledge, this study is the first to investigate the likely separate impacts of exports and imports on poverty, particularly in Taiwan.

Second, this study focuses on the nexus after Taiwan's economic liberation since 1987 and extends their study to cover more recent years. Soon after the liberation, the dominance of the inward foreign direct investment (FDI) gives way to the outward FDI. Therefore this focus is likely to provide a clearer picture of the impact of outward FDI on the poverty on Taiwan. This is important because Tsai and Huang (2007) found no significant influence of outward FDI in Taiwan. To the best of our knowledge, their study

is the only country-specific study investigating the effect of outward FDI from the home country on the living condition of people at the bottom of their own society. Moreover by so doing, our study is free from the likely distortion of the unusual period from 1963 to 1975, during which the inflation rate reached 120% in Taiwan (Harrison, 2006). Our results accordingly could provide more relevant information to develop strategies to cope with economic globalization.

The rest of the paper is organized as follows. Section 2 briefly discusses how international trade and FDI can influence poverty. The next section describes the characteristics of the data. Sections 4 and 5 present and discuss the empirical long-run and short-run results, respectively. The final section summarizes the major findings.

## TRADE, FDI, AND POVERTY

The effect of international trade on poverty mainly proceeds in two steps: Trade promotes growth, and growth reduces poverty (J. Bhagwati & Srinivasan, 2002). Trade has long been characterized as an engine of growth (Robertson, 1940). Particularly, international trade offers participating nations opportunities to economic growth. This is because international competition forces domestic firms to improve efficiency (Tsai & Huang, 2007). Moreover, international trade helps transmit price signals from international markets to domestic markets to enhance the efficiency of resource allocation in accordance with comparative advantages of participating nations (Tsai & Huang, 2007). These in turn lead to more rapid economic growth (Tsai & Huang, 2007).

It is a widely held view that the benefit of economic growth then distributes automatically across all segments of society (Zaman, Ikram, & Ahmad, 2009). Through the trickle-down effect, which is the foremost thinking in the 50s and 60s, international trade contributes to poverty reduction (Tsai & Huang, 2007; Zaman et al., 2009). Besides, economic growth can increase tax revenue, which enables governments to invest

in poor infrastructure, such as education and social safety nets, and thus alleviate poverty (Dollar & Kraay, 2004; Hoekman, Michalopoulos, Schiff, & Tarr, 2001).

Nevertheless, comparative advantages of the participating countries also influence whether trade-led economic growth can indeed reduce poverty (Tsai & Huang, 2007). If the advantages lie in the labor-intensive sectors where most of the poor are in, adoption of liberalization trade policy should benefit the poor as export increases, according to the Stolper–Samuelson theorem (Tsai & Huang, 2007). The theorem predicts that expansion of the export sectors would either increase real wages for labor or create more jobs for the unemployed. However, rigidity in the labor market may challenge the Stolper–Samuelson theorem and lead to more unemployment and poverty.

Trade liberation also opens the participating countries' economies to external competition (Chitiga, Kandiero, & Mabugu, 2005). If the intensified competition shrinks domestic competing sectors, people working in these sectors are likely to lose their jobs or be forced to accept lower real wages. Thus, through import competition, international trade could increase poverty. Interestingly, the existing empirical studies only focus on the potential benefits from export expansion and ignore the potential harms from import competition. The current study fills the gap and enhances the understanding of trade liberation to poverty.

The conventional wisdom presumes that inward FDI is beneficial to poverty in the host countries (Huang et al., 2010). This is because, being a collection of external capital, production technology, and management skill, inward FDI potentially could create employment, provide technical training, and increase wages (Tsai & Huang, 2007). Nevertheless, if low-skilled production activities in the investing nations are high skilled for the hosting nations, as depicted in Feenstra and Hanson's (1997) north–south model, the inward FDI will increase demand for skilled labor and thus deteriorate poverty (Huang et al.,

2010; Tsai & Huang, 2007). This result defies the conventional wisdom.

In the north–south model, outward FDI reduces low-skilled production activities and thus increases poverty in the investing nations. This is consistent with the implications of Jalilian and Weiss (2002), Majid (2003), Agénor (2004), and Santarelli and Figini (2004). Nevertheless, globalization proponents maintain that outward FDI may not harm the poor because globalization is a process of efficiently reallocating world resources (Tsai & Huang, 2007).

Compared to trade liberation, relatively few studies empirically examine the influences of international capital liberation on poverty. The list includes Jalilian and Weiss (2002), Majid (2003), Agénor (2004), Santarelli and Figini (2004), Tsai and Huang (2007), and Huang et al. (2010). Except for the two latest studies, all other studies exclusively focused only on the influences of inward FDI on the host nations. Tsai and Huang (2007) examined the impacts of both inward and outward FDI on Taiwan's poverty. They found no significant influences of both types of FDI. On the contrary, when conducting cross-country studies on East Asian and Latin American nations, Huang et al. (2010) documented adverse impacts of both inward and outward FDI on poverty. This current study contributes to the scant literature by reexamining the influences of both inward and outward FDI on Taiwan's poverty after its deregulation of capital outflows in 1987. This should provide clearer evidence on the impact of outward FDI.

## DATA SOURCES AND PREVIEW

To explore the globalization–growth–poverty nexus in Taiwan after its economic liberalization, this study follows Tsai and Huang (2007) closely in selecting the series to study. Different from theirs, the current study collects import and export amounts separately, instead of international trading as a whole. As discussed in the previous section, import competition may have a harmful effect while export expansion is likely to have

a favorable effect on poverty. This separation allows import and export to have distinct effects on poverty.

Particularly from the Web sites of the Directorate-General of Budget, Accounting and Statistics (DGBAS; <http://www.dgbas.gov.tw>) and the Taiwan Economic Journal (TEJ; <http://www.tej.com.tw>), this study collects the mean income of the poor ( $MIP$ ), which is the share of income earned by the bottom quintile of Taiwan's population multiplied by the mean income of the population and then divided by 0.2, and the following series: (1) the mean income of Taiwan's population ( $MI$ ), (2) import amount divided by gross domestic product ( $GDP$ ) ( $Imp / GDP$ ), (3) export amount divided by  $GDP$  ( $Exp / GDP$ ), (4) inward foreign direct investment divided by  $GDP$  ( $InFDI / GDP$ ), (5) outward foreign direct investment divided by  $GDP$  ( $OutFDI / GDP$ ), (6) the share of government consumption in  $GDP$  ( $GovCons / GDP$ ), and (7) the share of government spending on social security in government consumption ( $SS / GovCons$ ). These

are annual series from 1987 to 2010. Following Hoesli, Lizieri, and MacGregor (2008), M. T. Lee, M. L. Lee, Lai, and Yang (2011), and M. T. Lee and M. L. Lee (2012), all series are set at 1 in year 2000 to eliminate scaling effects.<sup>1</sup> Furthermore, the series are logged the same as in the study of Tsai and Huang (2007).<sup>2</sup>

To explore the influence of the other variables on the mean income of the poor, it is essential to perform unit root tests first to investigate their time series properties. Following Hill, Griffiths, and Lim (2012), this study first plots and inspects the series and then selects suitable Dickey–Fuller (DF) tests accordingly.<sup>3</sup> Table 1 presents the results. Specifically, the results on level series indicate that  $MIP$ ,  $MI$ ,  $Imp / GDP$ ,  $Exp / GDP$ , and  $SS / GovCons$  have unit roots and thus are not stationary at the level of 5% significance. On the other hand,  $InFDI / GDP$ ,  $OutFDI / GDP$ , and  $GovCons / GDP$  are stationary. The results on differenced series further clarify that the former are I(1) and the latter are I(0). These results are largely in line with those of Tsai and Huang (2007).

Table 1  
Unit Root Tests

	DF tests	P-value
<b>Level series</b>		
$MIP$	-1.993	0.574
$MI$	-3.597	0.052
$Imp / GDP$	-2.961	0.163
$Exp / GDP$	-0.469	0.881
$InFDI / GDP$	-3.690**	0.012
$OutFDI / GDP$	-3.586***	0.006
$GovCons / GDP$	-4.269***	0.003
$SS / GovCons$	-1.628	0.096
<b>Differenced series</b>		
$\Delta MIP$	-3.062**	0.045
$\Delta MI$	-2.440**	0.014
$\Delta (Imp / GDP)$	-7.224***	0.000
$\Delta (Exp / GDP)$	-4.533***	0.000
$\Delta (InFDI / GDP)$	-6.053***	0.000
$\Delta (OutFDI / GDP)$	-4.780***	0.000
$\Delta (GovCons / GDP)$	-3.14***	0.003
$\Delta (SS / GovCons)$	-6.699***	0.000

Note:

1. The Dickey–Fuller (DF) tests contain maximum one lag.

2. \*\*\*significant at the 1% level. \*\*significant at the 5% level.

### THE LONG-RUN RELATIONSHIP

This section explores the long-run globalization–growth–poverty nexus in Taiwan. Based on the data preview, we follow Tsai and Huang (2007) and examine the cointegration between the mean income of the poor and the mean income of the population first.<sup>4</sup> Particularly, we specify the tentative long-run relationship between the mean income of the poor and the mean income of the population as below:

$$MIP_t = \alpha_0 + \alpha_1 MI_t + e_t \tag{1}$$

To determine the existence of the above long-run relationship, we adopt the Engle–Granger

procedure for cointegration (Enders, 1995).<sup>5</sup> The test is effectively for the stationarity of the ordinary least square residuals from Equation 1. If the residuals are stationary, then the variables are cointegrated. If the residuals are not stationary, then the variables are not cointegrated, and any apparent regression relationship among them is spurious (Hill et al., 2012). The test for the stationarity of the residuals is based on Equation 2:

$$\Delta \hat{e}_t = a e_{t-1} + \varepsilon_t \tag{2}$$

where  $\Delta \hat{e}_t = e_t - e_{t-1}$ . If we cannot reject the null hypothesis  $a = 0$ , then the residuals are not stationary, and thus, the variables are not cointegrated.

Table 2  
*Cointegration Tests*

Dickey-Fuller Tau statistics	1% critical value	5% critical value
<b>Panel A: Between <i>MIP</i>, and <i>MI</i></b>		
4.162***	3.96	3.37
<b>Panel B: Among <i>MIP</i>, <i>MI</i>, <i>Imp / GDP</i>, <i>Exp / GDP</i>, and <i>SS / GovCons</i></b>		
-3.202	-3.96	-3.37

Note:

1. The critical values for the tau tests are taken from (Hill et al., 2012)).
2. \*\*\*significant at the 1% level.

Panel A of Table 2 presents the  $\tau$  statistics for the cointegration test. The  $\tau$  statistic is 4.162, which is greater than 3.96, the critical value at the level of 1% significance. This leads to reject the null hypothesis of no cointegration. This implies that the mean income of the poor and the mean income of the population are cointegrated and presents a deviation from the results of Tsai and Huang (2007). They concluded that the mean income of the poor and the mean income of the population move apart in the long run. On the contrary, our test result indicates the two variables share a common trend in the long run. This implies that the income of the poor is likely to increase with economic growth in long run.

The deviation is likely because the test of Tsai and Huang (2007) failed to consider the structural breaks due to the inflation regime shift in 1975 and the economic liberation in 1987 (Beyer, Haug, & Dewald, 2009; Gregory, Nason, & Watt, 1996).

Since *Imp / GDP*, *Exp / GDP*, and *SS / GovCons* are also not stationary, we further examine whether they are cointegrated with *MIP* and *MI*. Likewise we first specify the following tentative long-run relationship between the mean income of the poor and the four non-stationary series as below:

$$MIP_t = \beta_0 + \beta_1 MI_t + \beta_2 (Imp / GDP)_t + \beta_3 (Exp / GDP)_t + \beta_4 (SS / GovCons)_t + e_t \tag{3}$$

Panel B of Table 2 presents the  $\tau$  statistics for the cointegration test. The  $\tau$  statistic is 3.202, which is less than 3.37, the critical value at the level of 5% significance. This fails to reject the null hypothesis of no cointegration. This is another deviation from the results of Tsai and Huang (2007) and indicates that import amount divided by GDP, outward foreign direct investment divided by GDP, and the share of government spending on social security in government consumption do not share a common trend with the mean income of the poor and the mean income of the population. This deviation may reflect methodological difference in cointegration tests. According to Hjalmarsson and Osterholm (2007), Johansen's (1988, 1991) maximum eigenvalue and trace tests adopted by Tsai and Huang (2007) are likely to reject no cointegration too often. Contrary to their conclusion, our result here implies that other factors do not cause the mean income of the poor and the mean income of the population to diverge in the long run. This implies that, in the long run, the poor are systematically neither the losers nor the winners from international trade and international capital liberation. This is consistent with the cross-country regression evidence of Dollar and Kraay (2004).

To estimate the long-run relationship between the mean income of the poor and the mean income of the population, this study adopted the Stock and Watson (1993) dynamic ordinal least squares (DOLS) method to derive the long-run equilibrium implied by Equation 1. The reason is that ordinary least squares (OLS) estimators

do not have asymptotic  $t$  distributions (Enders, 1995; Wooldridge, 2003). This is because the right-hand side of the regression may be endogenous and arbitrarily correlated with the cointegration errors. The endogeneity invalidates the strict exogeneity assumption, which is an important condition needed to obtain asymptotic  $t$  statistics (Wooldridge, 2003). Thus, conducting significance tests on OLS estimators should be avoided (Enders, 1995).

Based on Monte Carlo evidence, DOLS is more favorable than Johansen's (1988), Bentzen's (2004), and M. Masih and A. M. M. Masih's (1996) estimators of long-run parameters. Particularly, the distribution of the DOLS estimators is less dispersed and has fewer outliers than Johansen's estimator (Thorbecke, 2006). In a DOLS framework, this study restates Equation 1 as follows:

$$MIP_t = \alpha_0 + \alpha_1 MI_t + \alpha_2 \Delta MI_t + e_t \quad (4)$$

where  $\Delta MI_t = MI_t - MI_{t-1}$ . We are interested in parameter  $\alpha_1$  which measures the long-run elasticity of the income of the poor with respect to the mean income of the population. Whether the benefits of economic growth for the poor are undermined by increases in inequality is a debate (Dollar & Kraay, 2002). If growth is usually accompanied with sharp increases in inequality in the long run, we expect  $\alpha_1 < 1$ . On the other hand, if economic growth does not cause an increase in inequality in the long run, we expect  $\alpha_1 \geq 1$ .

**Table 3**  
*The Long-Term Relationship with the Mean Income of the Poor*

	Coefficient	P-value
Constant	-0.047***	0.001
<i>MI</i>	0.929***	0.000
$\Delta MI$	0.761***	0.022
$R^2$	0.973	

Note:

1. P-values are computed with heteroskedasticity and autocorrelation robust standard errors.
2. \*\*\*significant at the 1% level.

Table 3 presents the parameter estimates from the DOLS regression.<sup>6</sup> The estimate of  $\alpha_1$  is 0.929 with  $p$  value of zero. This indicates that the long-run elasticity of the income of the poor with respect to the mean income of the population is positive at the level of 1% significance. In other words, economic growth is typically associated with an increase in the average income of the poor in the long run. However, the poor may not benefit proportionately if  $\alpha_1 < 1$ . To test this, we further compute an  $F$  statistic to test the null of  $\alpha_1 = 1$ . The  $F$  statistic is 1.537 with  $p$  value of 0.229. The statistic can not reject the null. That is, our DOLS regression result suggests that growth in the mean income of the population is associated with the same proportional growth in income of the poor in the long run.

Since the average income of the poor is proportional to the share of income accruing to the poorest quintile multiplied by the mean income of the population, the regression can be viewed as examining how a particular measure of income inequality, the poorest quintile share, varies with the average income of the population (Dollar & Kraay, 2002, 2004). Therefore, the evidence signifies that economic growth does not systematically increase income inequality in the long run. Our time series evidence complements the cross-country regression evidence of Dollar and Kraay (2002, 2004) and corroborates their finding on the importance of economic growth for poor reduction.

### THE SHORT-RUN RELATIONSHIP

This section explores the short-run globalization–growth–poverty nexus in Taiwan. The empirical method is along the lines of Dollar and Kraay (2002, 2004) and Huang et al. (2010), who studied similar issues with the cross-country data. Similar to Tsai and Huang (2007), this current study explores the issue with time series data. Given the results in the preceding section, we follow their approach and adopt an error correction model.

Particularly, this study specifies the empirical error-correction regression below:

$$\Delta MIP_t = \gamma_0 + \gamma_1 \Delta MI_t + \gamma_2 \Delta (Imp / GDP)_t + \gamma_3 \Delta (Exp / GDP)_t + \gamma_4 \Delta (SS / GovCons)_t + \gamma_5 (GovCons / GDP)_t + \gamma_6 (InFDI / GDP)_t + \gamma_7 (OutFDI / GDP)_t + \gamma_8 ECT_{t-1} + e_t \quad (5)$$

where  $\Delta MI_t$ ,  $\Delta (Imp / GDP)_t$ ,  $\Delta (Exp / GDP)_t$ , and  $\Delta (SS / GovCons)_t$  are defined in the same way.  $ECT_{t-1}$  is the error correction term, which is the one-period lagged residuals from Equation 4 (Wooldridge, 2003). The parameter measures the short-run elasticity of the average income of the poor with respect to the mean income of the population. The parameters  $\gamma_2$  to  $\gamma_7$  measure the direct short-run impacts of import divided by GDP, export divided by GDP, the share of government spending on social security in government consumption, the share of government consumption in GDP, inward foreign direct investment divided by GDP, and outward foreign direct investment divided by GDP respectively. The parameter  $\gamma_8$  is the speed adjustment coefficient and measures how the change in the mean income of the poor responds to the deviation from the long-run equilibrium between the mean income of the poor and the mean income of the population in year  $t - 1$ .

Having detected that the poor benefit proportionately from economic growth in the long run, we expect the same thing in the short run, that is,  $\gamma_1 = 1$ . This expectation is in accordance with the finding of Tsai and Huang (2007), who found that sharp increases in inequality does not accompany economic growth in Taiwan in the short run. It is widely expected that, through intensifying domestic competition, import is harmful to the poor as mentioned before. Therefore,  $\gamma_2$  is expected to be negative. As to the effect of export, it is widely believed that, through expansion of the export sectors, export is beneficial to the poor as mentioned before. Therefore,  $\gamma_3$  is expected to be positive.

Tsai and Huang (2007) expected that government spending on social securities and

government consumption have positive impacts on the mean income of the poor. It is because both are usually expected to be related to the provision of public goods, social safety net, and redistribution of incomes and assets to the poor (Tsai & Huang, 2007). This leads to the expectations for  $\gamma_4 > 0$  and  $\gamma_5 > 0$ . Given its generally accepted positive role, inward FDI is expected to be no harm to the poor despite the existence of conflicting arguments (Feenstra & Hanson, 1997; Huang et al., 2010; Tsai & Huang, 2007). Accordingly, this study expects  $\gamma_6 > 0$ . This study expects the impact of outward FDI to be negative, that is  $\gamma_7 < 0$ . This is because of the wide belief that labor-intensive firms made massive outward investment after the mid 1980s and thus destroyed jobs and depressed wages (Huang, 2007). Finally,  $\gamma_8$  is expected to be negative given the cointegration between the mean income of the poor and the average income of the population documented in the previous section (Hill et al., 2012).

In Equation 5, all variables are contemporaneous terms except the error correction term. These contemporaneous variables are likely to be endogenous (Tsai & Huang, 2007). In fact, Hausman test statistics are statistically significant and reject the null hypothesis that ordinary least squares estimates are consistent (Hausman, 1978). The statistics signify the existence of endogenous problem. To avoid the possible endogenous bias, we follow Tsai and Huang (2007) and adopt the instrumental variable method to estimate Equation 5. Particularly similar to their study, this study employs in all regression estimation the same set of instrumental variables: one- and two-period lagged explained variables, one- and two-period lagged explanatory variables, and the error correction term. To assess the adequacy of the instruments, we conduct the Sargan overidentification test (Sargan, 1958). The test statistics validate that the instruments are exogenous and can help solve the endogenous problem.

Table 4 presents the short-run regression results.<sup>7</sup> Column 1 shows the estimation results of Equation 5. Columns 2, 3, and 4 display

the results that exclude insignificant variables to serve as robustness checks. Several silent features stand out in the results displayed in the table. First, all specifications have similar and high explanatory powers. Each explains more than 91% of the variation of the mean income of the poor over time. The explanatory powers are comparable with those in the study of Tsai and Huang (2007). Second, as expected, the error correction terms have statistically significant and negative coefficients in all regressions. That is,  $\gamma_8$  is significant and negative in all regressions. The significant speed adjustment coefficients provide additional evidence for the cointegration between the mean income of the poor and the mean income of the population (Hill et al., 2012). Contrary to Tsai and Huang (2007), these coefficients signify that the change in the mean income of the poor responds to the deviation from long-run equilibrium between the mean income of the poor and the mean income of the population in year  $t - 1$ . More specifically, when the mean income of the poor exceeds its long-run equilibrium relationship with the mean income of the population in the previous period, the mean income of the poor falls, and its change becomes negative. The discrepancy between our result and that of Tsai and Huang (2007) may reflect the stages of Taiwan's economic development. In particular, labor-intensive SMEs (small- and median-sized enterprises) cease to drive economic growth after the economic liberation in Taiwan (Tsai & Huang, 2007). Since stemming mainly from labor income (Loayza & Raddatz, 2010), the income of the poor ceases to drive the equilibrium relationship and adjusted toward the relationship instead.

Third, the coefficient estimates of the change in the average income of the population,  $\gamma_1$ , are significant and positive at the 1% significance level in all equations. The estimates are 1.120, 1.038, 1.091, and 1.059 in Columns 1 to 4, respectively. The corresponding chi-square statistic for testing the null of  $\gamma_1 = 1$  is 0.255, 0.122, 1.097, and 0.398 with  $p$  values of 0.613, 0.727, 0.295, and 0.528. The statistics cannot



Table 4  
*Short-Term Relationships with the Mean Income of the Poor*

	Specification			
	(1)	(2)	(3)	(4)
Constant	-0.021** (0.014)	-0.020** (0.011)	-0.015*** (0.001)	-0.014*** (0.003)
$\Delta MI$	1.120*** (0.000)	1.038*** (0.000)	1.091*** (0.000)	1.059*** (0.000)
$\Delta(Imp / GDP)$	-0.072 (0.297)	-0.063 (0.364)	-0.075 (0.328)	
$\Delta(Exp / GDP)$	0.331*** (0.000)	0.342*** (0.000)	0.342*** (0.000)	0.243*** (0.000)
$\Delta(SS / GovCons)$	-0.074** (0.003)	-0.071*** (0.003)	-0.068*** (0.003)	-0.065*** (0.009)
$GovCons / GDP$	-0.044 (0.599)			
$InFDI / GDP$	-0.006 (0.323)	-0.005 (0.322)		
$Out FDI / GDP$	-0.013 (0.416)	-0.012 (0.166)		
$ECT$	-0.195** (0.023)	-0.224** (0.033)	-0.232* (0.054)	-0.273** (0.013)
Trade	0.259**	0.279***	0.267***	
Liberalization	(0.000)	(0.000)	(0.000)	
Capital	-0.019*	-0.017**		
Liberalization	(0.068)	(0.045)		
$R^2$	0.922	0.919	0.914	0.911

Note:

1. P-values are in parentheses and computed with heteroskedasticity and autocorrelation robust standard errors.
2. \*\*\*significant at the 1% level. \*\*significant at the 5% level. \*significant at the 10% level.

reject the null hypothesis. These corroborate the finding of Tsai and Huang (2007) that the change in growth in the mean income of the population is associated with the same proportional change in the income growth of the poor in the short run. These are in contrast to the cross-country evidence of Huang et al. (2010) but consistent with those of Dollar and Kraay (2002, 2004). According

to Kuznets (1955), the discrepancy between our result in Taiwan and that of Huang et al. (2010) in East Asia and Latin America is likely due to the difference in economic development stages of the studied countries.

Fourth, import and export clearly have different impacts on the mean income of the poor. Our results are not directly comparable with those

of Tsai and Huang (2007) since they use total international trade in their study. The distinct impacts substantiate our contention and highlight the importance to separate international trade into import and export in studying the impacts of trade liberalization. More importantly, this tells that not all international trade activities are good for the poor. Particularly, the coefficients of change in import are statistically insignificant and negative and, on the other hand, the coefficients of change in export are significant and positive in all regressions. Although,  $\gamma_2$  is negative as expected, it is not statistically different from zero. Therefore, the estimates can only be viewed as weak evidence at most that import may be harmful to the poor. The statistically positive  $\gamma_3$  at 1% significance level provides strong evidence that export has a direct contribution to raise the mean income of the poor in the short run. This is consistent with the Stolper–Samuelson theorem (Tsai & Huang, 2007). Specifically, in the short term, every 1% increase in the ratio of export to GDP leads to about 0.331% increase in the mean income of the poor, in addition to that brought by economic growth. To assess the total effect of international trade, we sum up  $\gamma_2$  and  $\gamma_3$ . The estimates are 0.259, 0.279, and 0.267 from Column 1, 2, and 3 respectively. All are significant at 1% level. This is consistent with the finding of Tsai and Huang (2007). They provided two explanations for the positive impact of trade in Taiwan: (1) Trade liberalization and other exports promoting together help Taiwan develop its comparative advantages fully, and (2) its export-led economic growth is unique because it is based on millions of small and medium enterprises, which adopt unskilled labor intensive technologies.

Fifth, government spending on social securities and government consumption do not have expected beneficial effects to the poor. The first finding is consistent with the finding of Tsai and Huang (2007). This could be because the social expenditure in Taiwan is ill targeted (Tsai & Huang, 2007). In Taiwan, the social expenditure includes government subsidies to national insurance, government employee and school staff insurance,

and labor insurance schemes. These subsidies may not be particularly propoor. For example, it is widely believed that government employees and school staff members are less likely to be in poverty than laborers in private organizations. However, government subsidies to the former are higher than those to the latter (Directorate-General of Budget, Accounting and Statistics, 2000). It is also likely that the simple share of government spending on social securities may not be a good measure of the propoorness of relevant policies (Dollar & Kraay, 2002; Tsai & Huang, 2007). Given the first finding, it is not surprising to find insignificant impacts of government consumption. This is because government consumption does not take into account social security spending and covers broad expenditures (<http://www.economytrack.org/gdp.php>). The second finding is consistent with the findings of Dollar and Kraay (2002, 2004) but is at variance with those of Tsai and Huang (2007) and Santarelli and Figini (2004). Obviously, the relationship between government consumption and poverty depends on how resources are actually allocated (Resnick & Birner, 2006). The discrepancy between our results with those of the two latter studies may reflect the ways the resources are allocated. In particular, increases in Taiwan's government consumption are largely driven by salary raises for government and military employees and public school teachers since the economic liberalization (Directorate-General of Budget, Accounting and Statistics, 2005). This may be the reason for finding of insignificant impacts of government consumption in this study.

Finally, capital liberalization has a significant and negative impact on the mean income of the poor. The sums of inward and outward FDI coefficients in Columns 1 and 2 are -0.019 and -0.017 and are significant at 10% and 5% significance level, respectively. As far as we know, this is the first statistically significant evidence showing the adverse influence of capital liberalization on poverty in Taiwan. However, individually inward and outward FDI have insignificant and negative coefficients. The

individual results are consistent with the short-run results of Tsai and Huang (2007). Although contrary to the conventional wisdom, the negative coefficient of inward FDI is consistent with the north–south model in which the inward FDI could increase demand for skilled labor and thus deteriorate poverty in Taiwan (Feenstra & Hanson, 1997; Huang et al., 2010; Tsai & Huang, 2007). This echoes the fact that the labor-intensive inward FDI in Taiwan was only apparent before 1974 (Tsai & Huang, 2007). As to outward FDI, its negative coefficient is consistent with the idea that outward FDI reduces low-skilled production activities and thus increases poverty in the investing nations. This is also consistent with the popular impression that accelerating investment to China by Taiwanese firms using low-skilled labor intensive technology in the past two decades has adverse impacts on the poor (Tsai & Huang, 2007).

## CONCLUSION

Understanding the impact of economic globalization on poverty is imperative for many poverty-attacking government institutions. Particularly, NGOs and street protestors has long argued that globalization-led growth fails to help the poor and benefits only the middle and upper classes (Tsai & Huang, 2007). Hoping to shed light on poverty reduction strategies, this study explores the globalization–growth–poverty nexus both in the long run and short run after Taiwan’s economic liberation in 1987.

The main findings revealed in this study are as follows:

- (1) Economic growth is important for poor reduction as, in both the long run and the short run, growth does not systematically exacerbate income inequality. This is consistent with the studies of Dollar and Kraay (2002, 2004) and Tsai and Huang (2007) but contrary to that of Huang et al. (2010).
- (2) Contrary to the conclusion of Tsai and Huang (2007), international trade and international capital liberation do not have direct impacts on the mean income of the poor in the long run.
- (3) In the short run, trade liberation has a positive effect on the mean income of the poor. Consistent with the Stolper–Samuelson theorem (Tsai & Huang, 2007), the positive benefit comes from export. However, import does not have a significant impact.
- (4) In the short run, capital liberalization has a significant negative impact on income inequality. This corroborates the cross-country finding of Huang et al. (2010) in East Asia and Latin America.

As poverty is an extremely complex phenomenon (Tsai & Huang, 2007), our empirical exercises, like those of Tsai and Huang (2007) and Huang et al. (2010), may be tentative and suggestive. However, we believe our results deserve serious attention because, as far as we know, this study is the first Taiwan study to investigate the separate impacts of export and import on poverty. The results confirm the distinct impacts of different international trade activities for the poor. These highlight the importance for poverty-attacking government institutions to shape trade strategies to boost export. In addition, our results on capital liberalization indicate that the warning with regard to the distributional effect of globalization may not be baseless.

## ENDNOTES

<sup>1</sup>Before logarithm was taken, variables, like  $Imp / GDP$ ,  $Exp / GDP$ , and  $SS / GovCons$ , are no longer bounded between 0 and 1 because of this approach.

<sup>2</sup>The DF test results are not sensitive to the use of logarithmic values for variables, like  $Imp / GDP$ ,  $Exp / GDP$ , and  $SS / GovCons$ .

<sup>3</sup>Specifically, following Hill et al. (2012), this study first plots and inspects the series and then decides to include a constant term and/or a time trend when conducting the Dickey–Fuller (DF) tests. This study also performs the Phillips–Perron (PP) test. The PP test results are consistent with the DF test results in Table 1 except  $GovCons / GDP$ ,  $\Delta MI$ , and  $\Delta(GovCons / GDP)$ . The PP test can only reject the unit–root hypothesis of  $GovCons$

/GDP with  $p$  value of 0.075. Facing the mixed evidence, this study further performs the Kwiatkowski–Phillips–Schmidt–Shin (KPSS) test on these series. The KPSS test results confirm that the three series are stationary. The KPSS test results also confirm the nonstationarity of  $SS / GovCons$  for which Tsai and Huang (2007) present mixed evidence. This approach is similar to that adopted by Osterholm (2005) and M. T. Lee et al. (2011).

<sup>4</sup>The ability of cointegration tests to detect cointegration depends more on the relationship between sample length and the length of long run than on the mere number of observations (Hakkio & Rush, 1991). The current study covers 24 years and thus is suitable to examine the long-run relationship.

<sup>5</sup>We adopt the Engle–Granger approach because Johansen's (1988, 1991) maximum eigenvalue and trace tests are likely to reject no cointegration too often (Hjalmarsson & Osterholm, 2007).

<sup>6</sup>The variance inflation factors are all less than 10 and thus signify no serious collinearity problem in the regression.

<sup>7</sup>Correlation coefficients among variables indicate no serious collinearity problem. When variables other than  $\Delta MIP$  and  $\Delta MI$  are not taken logarithm, the resulting short-run regressions offer broadly and qualitatively similar conclusions to Table 4. Nevertheless the regressions produce significant negative coefficients for  $\Delta(Imp / GDP)$  and insignificant coefficients for  $ECT$ . However the resulting short-run regressions have lower  $R^2$  values. Arguably this lends extra support to take logarithm of these variables in addition to following Tsai and Huang (2007).

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