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**The Recession and its Impact on Foreign Direct Investment Flows into the Food System
of Less Developed Countries**

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Introduction:

In economics, a recession is a general slowdown in economic activities over a sustained period of time. Often the economy experiences a steep fall in the GDP and a steep increase in unemployment. The consequence of a recession is indubitably devastating for an economy and it has a number of adverse effects in the economy. The economy suffers a reduction in the consumer expenditures that affect the business and production activities of the market, unemployment hampers the job market, inflation brings along higher prices and lower purchasing power, there is slow or no income growth, and there is a fall in interest rates and investment (Rana).

The global economy has been facing a downturn in last few months. It is predicted that the slowdown will lead to a real drop in financial flows and export earnings for developing country economies. This is because any fall in the global economy, affects the income and growth of the dependent developing economies.

The recent financial crisis and recession has posed a question, “What impact will the economic recession have on foreign direct investment (FDI) flows?”, which is important for those involved in policy making in the development community. The question is not without merit because a fall in the interest rate due to a shrinking global economy leads investors to draw back money because they feel insecure and fear of the approaching market situation. So, there is a decline in FDI flows. Many economists have predicted that the recession will have a negative impact on international competitiveness and FDI flows.

According to Finger, the fall in global GDP and the financial crisis will make it more difficult to raise financing, so he predicts a 13% decline in the number of greenfield FDI projects in 2009. Greenfield investments in developed economies are predicted to fall even faster than this for 2009. Finger also reported that some organizations are forecasting a fall of up to 50% in FDI flows because of a sharp decline in merger and acquisition (M&A) activity for 2009. The IIF estimates that foreign direct investment in developing economies will fall by 34 per cent between 2007 and 2009 (ActionAid).

In FDI Magazine, the reporter said that the global recession and financial crisis had caused a fall in FDI flows of 21% (or \$1450bn) in 2008. According to this report, the Economist Intelligence Unit anticipated a further decline of 49% in FDI flows in 2009. The Unit supported Finger’s assertion that the fall in FDI flows is driven primarily by the fall in

cross border M&As: the financial crisis limits a firm's ability to fund M&As because share prices (and hence the value of companies) have declined.

Venner reported that the current financial crisis has had a cascading effect on the performance of countries all across the development spectrum: the slowdown in growth has negatively affected the growth performance of the countries. He also said that a decline in FDI flows had significant, negative impacts on the growth performance of most countries.

To answer the question, what impact the US recession will likely have on Australia, the Yahoo Answer website reported that foreign investment from the US has been growing at an annual rate of 25 per cent, compared to 17 per cent for investment from all sources over the last five years, and the US supplies one third of all foreign investment in Australia. Australia is the ninth largest provider of foreign direct investment (FDI) in the United States. Due to the economic slowdown in the US, US-Australia trade volumes will be adversely affected too.

Gibbs forecasted that a major recession in the US would have an impact on Australia, though Australia's economic growth is now more dependent on strong demand from Asia than from the US. However, the global head of economics for the Macquarie Group said that a possible recession in the US would not necessarily cause one in Australia. Page said that the Australian economy would suffer from contagion effects if the slowdown of the US economy impacts other countries (like China), which will, in turn, impact the Australian economy.

We have certainly seen the recession spread through these linkages. The Jakarta Globe said that FDI inflows have fallen in China due to the global economic slowdown -- for example, Beijing drew \$34.05 billion in foreign direct investment in January to May 2009, which is 20.4 percent less than in the same period in 2008. Finzer also reported that a steep fall in GDP growth reduced China's FDI market size by about \$150bn in 2008 compared with what investors were projecting just a year ago. Finger also anticipates a decline in greenfield investment in China in 2009.

According to O'Hora's report, the National Irish Bank stated that the value of FDI flows into Ireland will likely drop to €2bn in 2009 from €2.3bn in 2008. O'Hora also reported that greenfield investment globally was set to fall 20% in 2009, which will accelerate the rate of job losses.

In Welch's report, the Managing Director of the International Monetary Fund, Murilo Portugal, said that a recession in the US would have a significant effect on the economies and day to day life in all Caribbean states.

According to the report from the NRI Realty News, the Minister for Overseas Indians Affairs, Vayalar Ravi, recently informed the Lok Sabha (the lower house of the Indian parliament), that the global recession had no impact on FDI from Indians abroad as it has registered a rise in the current fiscal year. Informing the lawmakers about investment figures from the states, Ravi said there had been no decline in investment due to global recession during 2008 as compared to 2007.

Safrina anticipates that the US economic recession might affect Indonesia: the recession would hit the country's exports and reduce foreign direct investment. However, she doesn't think Indonesia should worry about the US recession because of the country's strong GDP growth: Indonesia's GDP growth was 6.2% in 2008 and is predicted to grow between 4% and 5% in 2009.

A number of empirical studies examine changes in FDI flows as influenced by the macro- and micro-determinants, out of which the works of Wang and Swain, Shaver et al., Gliberman and Shapiro, and Wang and Wong are notable. However, the literature is largely silent regarding the impact analysis of economic recession on FDI flows both in the developed and developing economies. In particular, no one has attempted to investigate this issue in the food system of the less developed countries. Food systems are very important to developing countries, not only as food consumers but also as food producers. FDI flows are very important in establishing and developing these industries over time. Therefore, it is imperative to investigate this issue which offers a unique opportunity to contribute to the existing literature.

Research Objectives:

This study investigates the effects of the current recession on FDI inflows and outflows in the food sector. The study attempts to test the hypothesis that the economic recession adversely affects the foreign direct investment in the food sector of the less developed countries. The specific objectives of this research include:

- a. To identify determinants that influence FDI inflows;
- b. To develop an econometric model to estimate changes in FDI inflows as influenced by factor determinants, including with the present recession; and
- c. To compare the impact of the recession on FDI in the food system in different developed and developing economies.

Model specification:

The main thrust of this study is to explore the impact of the economic recession on foreign direct investment, and to do so, the study follows the following econometric framework:

$$FDI_{it} = f\left(D_{it}^{+/-}, R_{it}^{-}\right) + \mu_{it} \quad (1)$$

where, FDI represents foreign direct investment of the host economy, D is a vector of determinants that explain foreign direct investment and R denotes the economic recession used as a dummy variable, which equals 1 if the economic recession exists in a particular year; μ represents a stochastic error term that is assumed to be independently and normally distributed with zero mean and constant variance, and the index i and t indicate an economy and time, respectively. In this econometric equation, the signs above the explanatory variables are the expected direction of their impact on the dependent variable.

Various empirical studies suggest that the size and growth of the market, proxied by the level of GDP in the host county, factor prices, exchange rates, profitability in the process of FDI inflows and the tariff protection in the host country are important macro-determinants of FDI inflows (Wang and Swain). In addition to the determinants, the study also considers some other factors that might influence the FDI flows.

Taking logs and appending the factor variables and an error term, we can write equation (1) as:

$$\ln FDI_{it} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GR_{it} + \beta_3 \ln XR_{it} + \beta_4 \ln WR_{it} + \beta_5 \ln TRF_{it} + \beta_6 \ln IMP_{it} + \beta_7 \ln USB + \beta_8 \ln OECD + R + \mu_{it} \quad (2)$$

Equation (2) is the classical double-log specification so variables are transformed by natural logarithm (\ln). The explanatory variables used in this model have a direct relationship to foreign direct investment flows. In this model, GDP is the change of gross domestic product in absolute term, and GR represents the real growth rates of the GDP; both the variables that explain market size are thought to influence FDI inflows positively. Therefore, the corresponding slope parameters, β_1 and β_2 , are expected to be positive. XR is the exchange rates between the home and host economies. The sign of the slope parameter β_3 is uncertain because exchange rates have an ambiguous impact on FDI according to some recent empirical studies. WR denotes the ratios of average wages of the host country to the home country. Low labor costs in the host economy attract FDI inflows, i.e. the lower the

host country wages, the larger the inflows of FDI, so it is anticipated that β_4 will be negative. TRF is the average *ad valorem* tariff rate for all imported products in the host country. Since the higher tariff protection in the host country leads a foreign exporting firm to invest more capital in the country, the coefficient of the tariff rates, β_5 , is expected to be positive. The coefficient on changes in imports in the host country, β_6 , is uncertain but most of the empirical studies showed increased host country imports positively impact FDI flows. USB represent the US government long term bond yields, and the coefficient of this variable, β_7 , is expected to be negative, which implies that increased cost of capital variable leads investors to invest capital in the home market rather than the foreign markets. $OECD$ denotes the average growth rates in OECD countries that might positively impact the host country's FDI flows because prosperity in the developed economies, like OECD countries, leads to higher growth rates in dependent economies. Therefore, the slope parameter for OECD, β_8 is expected to be positive. Finally, R measures whether the economic recession impacts FDI inflows. It is anticipated that the coefficient of the dummy variable is negative, which implies that the economic recession leads to lower FDI inflows.

We can estimate panel regressions using a fixed effects or a random effects model. This classification depends upon alternative assumptions about error terms and how the coefficients change over cross sectional units or time. In fixed effect models, differences over cross-sectional sectors are assumed to be reflected in the intercept term that accounts for time invariant attributes, while in random effects models, this attribute is divided into a mean intercept and a group specific error; it is treated as a random variable in the model (Han). Both the models are recognized as econometric techniques to solve simultaneity problems but each has its own caveats and can produce quite different results. The issue of preference of one over the other is highly arguable. In order to examine the relationship between the FDI inflows, we employ both models. These two models are again divided into two groups: (a) one way model that does not consider a time specific effect, and (b) two way model that includes the time specific effect. The final empirical models have the following four forms:

$$\begin{aligned}
 \text{FIXONE: } \ln EDI_{it} = & \beta_{0i} + \beta_1 \ln GDP_{it} + \beta_2 \ln GR_{it} + \beta_3 \ln XR_{it} + \beta_4 \ln WR_{it} \\
 & + \beta_5 \ln TRF_{it} + \beta_6 \ln IMP_{it} + \beta_7 \ln USB + \beta_8 \ln OECD + R + \mu_{it}
 \end{aligned}
 \tag{3}$$

where β_{0i} is an individual special attribute that is constant over time and μ_{it} is a classic error term with $E(\mu_{it}) = 0$ and $V(\mu_{it}) = \sigma^2$

$$\begin{aligned}
\text{FIXTWO: } \ln EDI_{it} = & \beta_0 + \beta_{0i} + v_t + \beta_1 \ln GDP_{it} + \beta_2 \ln GR_{it} + \beta_3 \ln XR_{it} + \beta_4 \ln WR_{it} \\
& + \beta_5 \ln TRF_{it} + \beta_6 \ln IMP_{it} + \beta_7 \ln USB + \beta_8 \ln OECD + R + \mu_{it}
\end{aligned}
\tag{4}$$

where β_{0i} is a group effect and v_t is a time effect for each period.

$$\begin{aligned}
\text{RANONE: } \ln EDI_{it} = & \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GR_{it} + \beta_3 \ln XR_{it} + \beta_4 \ln WR_{it} \\
& + \beta_5 \ln TRF_{it} + \beta_6 \ln IMP_{it} + \beta_7 \ln USB + \beta_8 \ln OECD + R + u_i + \mu_{it}
\end{aligned}
\tag{5}$$

where β_0 is a constant and u_i is an error characterizing the i th observation and constant over time, with $E(u_i) = 0$, and $V(u_i) = \sigma^2$, $E(u_i u_j) = 0$ for $i \neq j$, and $Cov(u_i, \mu_{it}) = 0$.

$$\begin{aligned}
\text{RANTWO: } \ln EDI_{it} = & \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GR_{it} + \beta_3 \ln XR_{it} + \beta_4 \ln WR_{it} \\
& + \beta_5 \ln TRF_{it} + \beta_6 \ln IMP_{it} + \beta_7 \ln USB + \beta_8 \ln OECD + R + u_i + w_t + \mu_{it}
\end{aligned}$$

(6) where w_t is an error reflecting the time effect for each period.

Data sources:

The panel data utilized in this model is collected for the period of 1990-2010, which includes the global recession period. In this impact analysis, the study considers the US economy and economies such as Australia, United Kingdom, and other OECD countries. The study attempts to explore the leading and fastest growing developing economies for FDI flows especially in the field of food and food products. As evidence from the literature, the growth economies for FDI (or the fastest growing countries for FDI in some cases) are China, Thailand, Azerbaijan and Kazakhstan in the Asia-Pacific region; Turkey, Russia and Serbia in Europe; Mexico, Argentina, Colombia, Chile, Peru, Costa Rica and Brazil in Latin America; and Libya, South Africa, Morocco, Egypt, Algeria Nigeria, Uganda, Mozambique, Ghana and Tunisia in Africa (Finger).

The data on nominal FDI flows are collected from International Financial Statistics (IFS), and the International Monetary Fund (IMF). To construct real FDI flows, the GDP deflator from the Federal Reserve Bank are needed. Each country's GDP based on constant 2000 US dollar, and per capita GDP (constant 2000 US dollar) are collected from World Bank Development Indicator (WDI). The data for tariff rates are collected from various OECD publications. The data are calculated to fit the respective variables as reflected in the model. The country's import data and growth rates of OECD countries are collected from

United Nations Statistics division and OECD STAN Database for industrial analysis. Data on all other variables, such as the wage rate and US bond yields, are collected from OECD STAN Database, WDI or relevant sources of the respective countries. The cross-sectional and time-series dimensions of the dataset will be solely determined by availability.

Results and discussion:

In order to investigate the impact of the recession on FDI flows in the food system in less developed countries, the study started collecting data but the analysis is not yet finalized. However, reviewing literatures especially some relevant works helped us think the model including its explanatory variables is appropriately developed, and the relationship of FDI flows with its factor determinants including economic recession would be perfectly addressed. The study found that some of the factors used in the model as influenced FDI flows as expected in the study model. As for example, the work done by Wang and Swain showed that the foreign direct investment in China by factors used in the study. As shown in the table from the work of Wang and Swain, the foreign direct investment in China was influenced in the expected manner by all factor determinants except tariff rates. In most of the cases the authors found that the GDP, real GDP growth rate (GR) impacted positively on FDI flows, while BOND and DISCOUNT, which represents costs of capital and political dummy showed negative impact on the FDI flows. The impact of wage and exchange rate risk was positive but other control variables like import and real productivity growth rates were negatively correlated to the foreign direct investment flows.

Table 2. Empirical results of the determinants of foreign direct investment in China, 1978–92.

Variable	2.1	2.2	2.3	2.4	2.5
Constant	109.34* (5.03)	109.69* (5.72)	95.44* (3.80)	91.10* (4.11)	90.02* (4.05)
GDP _(t-1)	0.018 (1.07)	0.013*** (1.73)	0.017*** (1.79)	0.022** (2.83)	0.021** (2.70)
GR _(t-1)	0.18 (0.34)				
TARIFF	-3.29* (-4.61)	-3.11* (-7.29)	-2.62* (-5.11)	-2.75* (-5.41)	-2.57* (-5.57)
WAGE	4.78 (1.19)	3.55** (2.29)	3.20*** (1.51)	4.35** (2.23)	3.71** (2.00)
BOND	-2.06** (-3.53)	-1.93* (-4.95)	-2.05* (-3.85)	-1.80* (-3.60)	-1.95* (-4.07)
DISCOUNT	-4.53** (-2.93)	-4.18* (-4.14)	-3.19** (-2.53)	-3.74** (-2.92)	-3.24** (-2.72)
EXRT	19.09** (2.51)	16.83* (4.98)	12.85** (3.19)	13.81* (3.47)	12.44* (3.31)
IMP	-0.16 (-1.15)	-0.12** (-2.42)	-0.09 (-1.40)	-0.11*** (-1.76)	-0.09*** (-1.55)
GROECD	1.03 (1.25)	1.22** (2.35)		0.55 (1.02)	
PRDTVY	-0.50 (-1.09)	-0.61*** (-2.11)	-0.19 (-0.61)		
DUMMY	-5.57*** (-2.13)	-4.97** (-2.86)	-3.56*** (-1.58)	-2.91*** (-1.56)	-2.91*** (-1.55)
R ²	0.98	0.99	0.96	0.94	0.97
\bar{R}^2	0.94	0.95	0.94	0.91	0.94
D-W	2.47	2.33	2.00	2.33	2.24
S-E	1.60	1.41	1.94	1.84	1.84
F	318.33*	449.23*	262.04*	295.06*	329.18*

Note: Number of observations = 15, *t*-statistics in parentheses.

* Significant at the 1 per cent level of confidence

** Significant at the 5 per cent level of confidence

*** Significant at the 10 per cent level of confidence.

Source: For critical values of the *t*-distribution and *F*-distribution, see Cassidy (1981, pp. 279–284).

Source: Empirical results from Wang, Z. Q. and N. Swain. 1997

Conclusion:

The shrinking global economy has in fact confirmed that the slow down in growth has negatively affected the growth performance of the less developed countries. The situation has been further compounded by the decline in foreign direct investment (FDI). It is expected that

less developed countries, which are dependent on foreign direct investment, experience a dramatic rise in the prices of commodities and manufacturing goods. It will be interesting to see how the recession puts a brake on FDI flows, and what impact the global recession has had on FDI flows in the food system of less developed countries.

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