Chapter 5:
Foreign Direct Investment and Economic Growth in Mexico: 1940–2013

José Romero

In his presentation, "Foreign Direct Investment and Economic Growth in Mexico: 1940–2013," José Romero, director of the Center for the Study of Economics of the Colegio de México, addressed the question of how foreign direct investment (FDI) affected productivity in Mexico for the 73-year period ended in 2013. He said that the study uses an aggregate production function that relates aggregate production with labor and with three types of capital: private domestic, foreign, and government. The study is also divided into two periods—1940–79 and 1984–2013. Romero concluded that in the first period, the impact of foreign capital on productivity exceeded that of private domestic capital, while in the second period , or the NAFTA period, the impact of private domestic capital on productivity exceeded that of foreign capital, which had only a minor (though positive) effect on growth.

Romero first introduced the empirical model he developed to test the impact of FDI on productivity, including the dependent and key independent variables. Next, he explained why the empirical model estimation is divided into two periods. Finally, he discussed his research findings and explained why foreign capital's impact on productivity is limited in the second period.

Data and Methodology

Romero first explained how he developed his empirical model. In his model, the dependent variable "labor productivity" is derived based on the following production function:

$$Y = AL^a K_p^b K_f^c K_g^d$$

where Y represents GDP, or total real production; L is total labor force; K_P is the domestic private capital stock; K_f is foreign capital, and K_g is government capital; $b, c,$ and d are parameters; and A represents the efficiency in production.

Romero noted that he took logs of the equation and found that:

$$y = \ln(A) + al + bk_p + ck_f + dk_g$$

where the small letters indicate the variables' natural logarithms.

Romero further stated that the next step was to take differences to obtain the growth rate of the equation, and he obtained:

$$g_Y = g_A + ag_l + bg_{k_p} + cg_{k_f} + dg_{k_g}$$

where g_i is the growth rate of variable $i = Y, A, L, K_p, K_f$ and K_g.

Finally, to obtain the expression for the growth of labor productivity, Romero subtracted the expression g_l from each side of the above equation and found that:

$$g_Y - g_l = g_A + (a - 1)g_l + bg_{k_p} + cg_{k_f} + dg_{k_g}$$

The empirical model was therefore rewritten based on the above derivation:

$$\Delta y_t - \Delta l_t = \Delta \ln (Y/L)_t = \beta_0 + \beta_1 \Delta l_t + \beta_2 \Delta k_{p,t} + \beta_3 \Delta k_{f,t} + \beta_4 \Delta k_{g,t} + \beta_5 \Delta tcr_t + \varepsilon_t$$

Where $\Delta ln(Y/L)_t$ is the growth rate of labor productivity, $\Delta k_{p,t}$ is the growth rate of domestic private capital investment, $\Delta k_{f,t}$ is the growth rate of foreign capital investment, and $\Delta k_{g,t}$ is the growth rate of government capital investment. Romero noted that the regression also includes the percentage variation of the real exchange rate [$\Delta rer_t = ln(RER_t) - ln(RER_{t-1})$] as an explanatory variable. According to Romero, it is introduced as a control variable for estimates of aggregate production functions in the case of small and open economies like Mexico.

Romero further noted that stationarity tests suggest that variables in levels are cointegrated. Hence, error-correction models were used to estimate the coefficients. Meanwhile, Romero also stated that he calculated the structural change, and found that the structural change happened in 1979 (at the start of the oil boom and before the debt crisis and the opening of the economy). He therefore established two error-correction models to estimate the coefficients in two different time periods: 1940 to 1979 and 1984 to 2013.

Major Research Findings

According to Romero, in the first period, the coefficients for $\Delta k_{p,t}$ $\Delta k_{f,t}$ and $\Delta k_{g,t}$ are 0.049, 0.082, and 0.393, respectively, indicating that during the first period, the driver of growth (of labor productivity) is government capital. Meanwhile, foreign capital shows an elasticity 1.7 times greater than domestic private capital. Romero noted that the reason foreign capital impacted productivity more heavily than domestic private capital during the period could be structural externalities, such as local-content requirements, export commitments, and the mandate that no more than 49 percent of its capital may be

foreign-sourced. These requirements allegedly lead to more technological spillovers, both vertical and horizontal.

Romero then explained the regression results for the second period. The results demonstrate that domestic private investment has the biggest impact over productivity in the second period, with a regression coefficient of 0.245. By contrast, foreign capital only plays a secondary role, with a regression coefficient of 0.116. Romero noted that it is surprising that the effect of accumulated foreign investment on labor productivity is much smaller than that of domestic private investment in the second period. He stated that it could be explained by the structural change itself, which allowed companies to be totally foreign owned. Therefore, domestic capital could no longer benefit from an association with foreign capital. The new model also did not require national content, discouraging any possible linkages or spillovers.

Conclusions

Using time series analysis, Romero found that in the first period (1940–79), Mexico's growth was led mainly by government investment, and that the impact of foreign investment on labor productivity outweighing that of private domestic investment. However, in the second period (1984–2013), growth was predominately led by domestic private investment, with foreign capital playing only a secondary role. Romero stated that foreign capital's minor effect on growth was mainly due to the limited spillover effect foreign capital created in the economy during the second stage. He explained that when NAFTA took effect in 1994, it helped develop a vertically integrated production network in North America, involving the fragmentation of productive processes. According to Romero, this action significantly altered the composition of FDI. From being targeted mainly at internal markets, FDI changed to take advantage of Mexico's comparative advantages and therefore became directed at labor-intensive stages of fragmented production. This process created few linkages to the rest of the economy and few spillover effects, hence limiting the effect of foreign capital on growth.

References

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