

How Much Does Foreign Capital Matter?

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This small note¹ with a swollen Appendix illustrates how foreign ownership data² and aggregate production function assumptions can be used to deduce what Canadian domestic output and national income might be if there were less foreign capital.

The appendix spells out the calculation procedure, which depends heavily on the assumed ease with which labour can be substituted for capital in the production process. Consider first two extreme possibilities. On the one extreme, if there were no substitution possible between capital and labour, then any reduction in the stock of capital would lead to proportionate drops in output and employment. In this sort of world, anything that jeopardizes the inflow of capital required to finance the technically-necessary capital-labour ratio has high costs in terms of unemployment and foregone income. At the other extreme, if there is perfect substitution between capital and labour, and if foreign capital is paid the value of its marginal product, then changing the amount of foreign capital would have no effect on national income. Domestic output would drop if the foreign capital were not present, but the amount of the drop would be just equal to the amount of output formerly used to pay the return on the foreign capital.

Somewhere between these two extremes lies the constant-returns Cobb-Douglas production function assumed in the present calculations. Under these assumptions, we need both capital and labour to get any output, but any combination of capital and labour can be usefully employed in co-operation. However, as labour is substituted for capital, the amount of extra labour required to replace one unit of capital increases as the amount of capital decreases. Under these conditions, therefore, it comes

¹ The idea of using a Cobb-Douglas production function to estimate the consequences of less foreign investment is based on earlier work by Phil Neher.

² The foreign ownership data and the assumed production function for business output have been developed as parts of the aggregate quarterly model RDX2. The theory, equations, and variables of the model are described in J. F. Helliwell, H. T. Shapiro, G. R. Sparks, I. A. Stewart, F. W. Gorbet, and D. R. Stephenson: *The Structure of RDX2*. Ottawa, Bank of Canada, 1971. (Bank of Canada Staff Research Studies, No. 7.)

as no surprise that national income would be lower if there were no foreign capital. The only contribution of this note is to take some fairly plausible assumptions about the aggregate production process and to estimate the size of the drop in per capita income that would be implied if only domestic capital were employed.

Data prepared for the quarterly model RDX2 suggest that at the end of 1970 the replacement value of business fixed assets and inventories in Canada, including those owned by government enterprises, was about \$107 billion. Of that amount, \$43 billion was owned by U.S. direct and portfolio investors and \$11 billion by other foreign investors. Less adequate data suggest that holdings of foreign assets by Canadian residents totalled \$7 billion at the end of 1970. If all Canadian equity were devoted to Canadian assets, and if the rest of the business fixed assets and inventories disappeared, then the capital stock at the end of 1970 would have had a replacement value of \$70.5 billion, 44.0% less than the actual value. If these assets were recast to the more labour-intensive techniques appropriate to the new regime, aggregate business output would drop by 18.4%. National income, and the per-capita incomes of Canadian residents, would drop by far less, because of the decline in net debt service payments. The national income from business would drop by 3.5%. The drop in gross national income would be less than the drop in gross business income, because the output of governments and non-commercial institutions is assumed unchanged. If we make the questionable further assumption that the same production process and the same capital-labour ratio apply to governments as apply to businesses, we can calculate the further drop in gross national income if there were no government bonds held by foreigners. If there were no foreign capital of any sort used in Canada (although we continue to assume Canadian official loans overseas and holdings of foreign exchange assets) then the replacement value of total government and business capital stock would be 40.2% lower than the actual value, gross domestic product³ would be 16.5% lower than at present, and gross national income would be 2.9% lower.

As indicated in Phil Neher's paper, there are many intermediate points between doing without foreign capital and accepting the consequences of the present level. As he indicates in his paper, and as shown in the appendix, any desired proportion of foreign ownership could be achieved by additional tax on foreign investment income. The foreign investors would

³ This figure is somewhat overstated as total capital stock used in the calculation does not include the stock of dwellings which would be unchanged by the reduction in foreign capital.

continue to get their existing after-tax rate of return, and the investment tax would just raise the cost of capital to firms high enough so that they choose techniques labour-intensive enough to keep everyone employed using the smaller stock of capital goods.

The domestic owners of capital would reap the monopoly return familiar to those operating behind other tariff walls, for the rate of return to domestic savers would be higher than at present. To avoid undesired transfers of income, the investment tax might also be levied on domestic returns to capital, and used to restore the sagging real wage.

The "no foreign capital" case described above would be achieved by an incremental tax of 28.4% on foreign investment returns. This would lead to a 39.7% increase in the rate of return to domestic savers and a 16.5% drop in the real wage.

If the incremental tax on foreign investment returns were 20%, there would still be substantial investment by foreigners, equivalent to about 30% of the present amount. Gross domestic product would be 11.3% lower than at present, and gross national income 1.5% lower.

Having exposed some apparently low-priced policy options, we emphasize that they are derived from a number of fairly restrictive assumptions. Their purpose is to encourage more discussion of the quantitative effects of foreign investment, in hopes of replacing some of the wilder claims about the economic necessity of foreign ownership on the one hand or its disastrous consequences on the other.

APPENDIX

f = original foreign ownership share

f' = foreign ownership share after imposition of tax on the earnings of foreign investment, measured as a fraction of original capital stock

X = original domestic output

X' = new domestic output

$X = A K^\alpha L^\beta$ Cobb-Douglas production function. Assumed $\alpha = .35$, $\beta = .65$.

Y = original national income

Y' = new national income

K = original capital stock

$K(1-f+f')$ = new capital stock = K'

r = world rate of interest

r' = domestic pre-tax rate of return

w = original real wage

w' = new real wage

Ratio of new output to old, assuming Cobb-Douglas production function

$$\frac{X'}{X} = \frac{A[(1-f+f')K]^\alpha L^\beta}{A K^\alpha L^\beta} = (1-f+f')^\alpha \quad (1)$$

Distribution of original national product, assuming constant returns and pure competition:

$$X = rK + wL \quad (2)$$

New distribution of product:

$$X' = r'(1-f+f')K + W'L \quad (3)$$

Efficient use of factors, in a Cobb-Douglas world, implies:

$$\frac{wL}{rK} = \frac{w'L}{r'(1-f+f')K} = \frac{\beta}{\alpha} \quad (4)$$

Using (1) and (4) in (2) and (3), we can solve for the ration of r' to r , and for the ratio of the new real wage to the old:

$$\frac{r'}{r} = (1-f+f')^{\alpha-1} \quad (5)$$

$$\frac{w'}{w} = (1-f+f')^\alpha \quad (6)$$

Original national income:

$$Y = r(1-f) K + wL \quad (7)$$

New national income:

$$Y' = r'[(1-f)K] + w'L + (r'-r) \cdot (f')(K) \quad (8)$$

Or, using (5) and (6), new national income is:

$$Y' = r(1-f+f')^{\alpha-1} (1-f)K + (1-f+f')^\alpha wL + (r'-r)(f')(K) \quad (9)$$

The third term, which is positive as long as there is some foreign ownership remaining, represents the national receipts from the tax on the earnings of foreign capital.

Using (5) again, and re-arranging the first and third terms in (9), we have:

$$Y' = rK(1-f+f')^\alpha + (1-f+f')^\alpha wL - f'rK \quad (10)$$

re-arranging the original national income, (7), for comparison, we have:

$$Y = rK + wL - frK \quad (11)$$

Comparing (10) and (11) we see that if the new foreign ownership share is lower than the original one, then net payments to foreign capital (the third term in each expression) will go down by the same proportion, while output

will fall by a smaller proportion. However, we can use (4) in (10) and (11) to show that the level of national income is lower if f' is between zero and f :

$$\frac{Y'}{Y} = \frac{(1+\beta/\alpha)(1-f+f')^\alpha - f'}{(1+\beta/\alpha)-f} \leq 1.0 \quad (12)$$

Under the assumptions stated, any desired value of f' can be achieved by levying a tax on foreign investment earnings at a proportionate rate $t = 1 - (1-f+f')^\beta$. This way of achieving a target amount of foreign investment is cheaper, in terms of foregone income, than the alternative method of restricting f' while letting foreign investors earn the same after-tax return as domestic savers. If Y'' is national income where f' is set by regulation, it is smaller than Y' by the amount:

$$Y' - Y'' = (r' - r)(f')(K) \quad (13)$$

This difference naturally approaches zero as f' approaches zero. In other words, if the tax rate is set high enough to make f' zero, national income will be the same as if the same autarchic result had been determined by regulation.