



## The Treatment of Global Firms in National Accounts

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### Introduction

In this letter, I review some foundations for the analysis of how the activities of global firms should be captured in national accounting frameworks. While the 2015 jump in Irish GDP provides the motivation for this contribution, I do not provide a detailed account of the factors contributing to the Irish case (Fitzgerald 2016, Honohan 2016, Stapel-Weber and Verrinder 2016). Rather, the focus is on developing an underlying accounting framework that can help shape the analysis of national accounts for economies in which globally-active firms play an important role. This work also relates to a recent literature that recognises the central role of internationally-mobile intangible capital in the operations of global firms (McGrattan and Prescott 2010).

One basic principle of a stable measure of overall economic performance is that it

should be robust to alternative accounting approaches. A second basic principle is that any sensible national index should be robust to alternative mechanisms by which the return to a foreign investor is paid out. To see this, the gross earnings accruing to a foreign investor can be written as

$$EARN^{FOR} = PTNOS^{FOR} + CFC^{FOR} + CORPTAX^{FOR} \quad (1)$$

where  $EARN^{FOR}$  is the gross operating surplus,  $PTNOS^{FOR}$  is the post-tax net operating surplus,  $CFC^{FOR}$  is the depreciation of domestic capital owned by the foreign investor and  $CORPTAX^{FOR}$  is the domestic corporation tax paid by the foreign investor.<sup>2</sup>

In the case of directly-owned foreign firms, the factor income of foreign investors is calculated as the accrued post-tax net

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<sup>2</sup>This formulation does not rule out a negative value for  $PTNOS^{FOR}$  if the gross operating surplus is not sufficient to cover depreciation charges and corporation taxes.

operating surplus in a given period

$$INCFDIL = PTNOS^{FOR} \quad (2)$$

where  $INCFDIL$  denotes investment income outflows associated with FDI liabilities.

Consider an economy in which production is generated by directly-owned foreign firms that hire domestic workers. In this scenario, the value of measured GDP is

$$GDP = WB + EARN^{FOR} \quad (3)$$

where  $WB$  represents total labour earnings. The value of measured gross national income (GNI) is

$$GNI = GDP - INCFDIL \quad (4)$$

$$GNI = GDP - PTNOS^{FOR} \quad (5)$$

Alternatively, suppose production is organised by a domestically-headquartered firm that is entirely owned by foreign portfolio investors. In relation to the international investment position, the composition of external liabilities in this case consists of portfolio equity liabilities, rather than FDI liabilities. According to BOP methods, income flows on FDI and non-portfolio debt are recorded on accrual, while income flows on portfolio debt and portfolio equity are recorded on a cash basis.

If the net operating surplus is paid out as a dividend to the foreign portfolio investor, the factor income of foreign portfolio equity investors is given by

$$INCPEQL = PTNOS^{FOR} \quad (6)$$

where  $INCPEQL$  denotes investment income outflows associated with portfolio equity liabilities.

Measured GNI is the same as in the previous example

$$GNI = GDP - INCPEQL \quad (7)$$

$$GNI = GDP - PTNOS^{FOR} \quad (8)$$

Alternatively, the firm may opt to retain the earnings on its balance sheet. In this case, the paid out dividend is zero and GNI equals GDP

$$INCPEQL = 0 \quad (9)$$

$$GNI = GDP \quad (10)$$

At the same time, all else equal, the value of the stock of portfolio equity liabilities increases by the addition to the retained earnings pool held on the balance sheet

$$\Delta STK^{PEQL} = PTNOS^{FOR} \quad (11)$$

In general, the foreign portfolio investor will be indifferent between receiving an immediate dividend versus enjoying a capital gain on the stock value of the portfolio equity holding, since the overall return is just the sum of the income stream and the capital gain

$$RET^{PEQL} = INCPEQL + \Delta STK^{PEQL} \quad (12)$$

However, under this alternative scenario, current GNI is inflated by the non-payout of a dividend. (At some future point, the eventual payout of retained earnings in dividends will imply a corresponding reduction in measured GNI.)

Accordingly, an adjusted measure of GNI that is unaffected by the timing of dividend payouts would just subtract the post-tax net operating surplus of foreign-owned firms from GDP

$$GNI^* = GDP - PTNOS^{FOR} \quad (13)$$

GNI is typically interpreted as the resources available to the domestic population, net of

the payout due to foreign investors. However, it is the gross payout to foreign investors that matters, which includes covering the depreciation of foreign-owned domestic capital, since gross earnings are partially absorbed by depreciation charges to cover consumption of fixed capital. That is, an adjusted measure of GNI should also subtract  $CFC^{FOR}$

$$GNI^* = GDP - PTNOS^{FOR} - CFC^{FOR} \quad (14)$$

$$GNI^* = WB + CORPTAX^{FOR} \quad (15)$$

That is,  $GNI^*$  corresponds to the sum of total labour earnings plus corporate tax revenues.

In what follows, I apply these principles to some specific examples.

## Foreign-Owned Intellectual Property Capital: Scenario I

Take the example of a global firm  $G$  that initially holds intellectual property capital ( $K_{IP}^{G,A}$ ) in country A and produces output in country B by combining local inputs ( $K^{G,B}; L$ ), IP services imported from country A and contract manufacturing services imported from country C ( $CM^C$ ).

The level of gross revenues in country B is

$$REV = P * Q(K_{IP}^{G,A}, K_T^{G,B}, L, CM^C) \quad (16)$$

where  $P$  is the output deflator,  $Q(\cdot)$  is the production function,  $K_T^{G,B}$  is the domestic tangible capital owned by the foreign investor and  $L$  is domestic employment.

The level of gross domestic product or gross value added in country B is

$$GDP = GVA = REV - ROY_{IP}^{G,A} - IMP_{CM}^C \quad (17)$$

where  $ROY_{IP}^A$  is the level of royalty payments to the country A unit of firm  $G$  and  $IMP_{CM}^C$  is the level of payments to the providers of contract manufacturing services in country C.

In turn, gross value added in country B can be split between the payments to the different owners of local inputs

$$GDP = GVA = EARN^{G,B} + WB^B \quad (18)$$

where  $EARN^{G,B}$  is the stream of gross domestic earnings accruing to firm  $G$  in relation to its ownership of  $K_T^{G,B}$  and  $WB$  is the domestic wage bill in country B.

The gross domestic earnings of the foreign firm are divided between consumption of fixed capital ( $CFC^{G,B}$ ) and net operating surplus ( $NOS^{G,B} = EARN^{G,B} - CFC^{G,B}$ ). In turn, net operating surplus can be split between corporate tax and post-tax net operating surplus ( $NOS^{G,B} = CORPTAX^{G,B} + PTNOS^{G,B}$ ).

We can rewrite GDP as

$$GDP = CFC^{G,B} + WB^B + CORPTAX^{G,B} + PTNOS^{G,B} \quad (19)$$

Gross national income in this scenario just strips out the post-tax net operating surplus of the global firm  $G$

$$\begin{aligned} GNI &= GDP - INCFDIL^{G,B} \\ &= CFC^{G,B} + WB + CORPTAX^{G,B} \end{aligned} \quad (20)$$

where  $INCFDIL^{G,B} = PTNOS^{G,B} = NOS^{G,B} - CORPTAX^{G,B}$ .

However, a better measure of the resources available to the domestic population would

also strip out the component of gross earnings that is allocated to cover the depreciation of foreign-owned domestic capital, since this component is not available for alternative domestic uses

$$\begin{aligned} GNI^* &= GNI - CFC^{G,B} \\ &= WB + CORPTAX^{G,B} \end{aligned} \quad (21)$$

## Foreign-Owned Intellectual Property Capital: Scenario II

Now take the alternative scenario by which firm  $G$  transfers  $K_{IP}$  from its unit in country  $A$  to its unit in country  $B$ . There is a step increase in the stock of FDI liabilities at the time of transfer (either in the form of FDI equity or FDI debt, depending on how the restructuring is financed). From the viewpoint of country  $B$ , its capital stock is now

$$K^{G,B} = K_T^{G,B} + K_{IP}^{G,B} \quad (22)$$

and depreciation is now

$$CFC^{G,B} = CFC_T^{G,B} + CFC_{IP}^{G,B} \quad (23)$$

while its stock of FDI liabilities is

$$\begin{aligned} FDIL^B &= FDIL_{EQ}^B + FDIL_{DEBT}^B \\ &= K_T^{G,B} + K_{IP}^{G,B} \end{aligned} \quad (24)$$

In this scenario, there is no change in gross revenues

$$REV = P * Q(K_{IP}^{G,A}, K_T^{G,B}, L, CM^C) \quad (25)$$

but GDP is now given by

$$GDP = REV - IMP_{CM}^C \quad (26)$$

with the earnings accruing to the IP capital stock now booked domestically ( $EARN_{IP}^{G,B} = ROY_{IP}^{G,A}$ )

$$\begin{aligned} GDP &= GVA \\ &= EARN_{IP}^{G,B} + EARN^{G,B} + WB \\ &= EARN^{G,B} + WB \end{aligned} \quad (27)$$

Gross national income subtracts the equity and debt income streams accruing to FDI investors, which are equal to the post-tax net operating surplus of the foreign-owned firms

$$GNI = GDP - INCFDIL^{G,B} \quad (28)$$

$$\begin{aligned} GNI &= GDP - (EARN^{G,B} - CFC^{G,B} \\ &\quad - CORPTAX^{G,B}) \end{aligned} \quad (29)$$

$$GNI = CFC^{G,B} + WB + CORPTAX^{G,B} \quad (30)$$

Again, a superior measure of the resources available to the domestic population would also strip out the depreciation of foreign-owned domestic capital, so that

$$GNI^* = GNI - CFC^{G,B} \quad (31)$$

$$GNI^* = WB + CORPTAX^{G,B} \quad (32)$$

We can see that  $GNI^*$  is unaffected across the two scenarios but  $GNI$  is higher under scenario II in view of the higher depreciation charge due to the booking of intellectual property capital as a domestic asset. Accordingly,  $GNI^*$  is a more stable measure, in addition to more accurately reflecting the gross resources available to the domestic population.

While depreciation of both tangible and IP types of capital is deducted to arrive at

$GNI^*$ , it remains important to keep track of the dynamics of both types of capital, since the investment criteria differ across location-specific and mobile types of capital assets.

## Redomiciled Firms

The primary measurement issue with redomiciled firms is that the measurement of the income accruing to foreign investors is delayed, since the income paid out to foreign portfolio investors is only recorded in the BOP on a cash basis, so that the return to a foreign shareholder in a firm that accumulates retained earnings is not immediately visible in the current account and gross national income. However, retained earnings should push up the value of portfolio equity liabilities by the same amount. So, adjusted GNI should subtract from GNI the undistributed component of the net operating surplus of these firms

$$GNI^* = GNI - (PTNOS^{RF} - DIV^{RF}) \quad (33)$$

where  $DIV^{RF}$  are the dividends paid to foreign holders of portfolio equity shares in redomiciled firms. Equivalently, we can calculate adjusted GNI as

$$GNI^* = GDP - PTNOS^{FOR} \quad (34)$$

Further modification would be necessary to the extent that the redomiciled firm is not a pure shell but also holds domestic capital, since the depreciation of foreign-owned

domestic capital should also be subtracted from a measure of domestic resources

$$GNI^* = GDP - PTNOS^{FOR} - CFC^{FOR} \quad (35)$$

## Aircraft Leasing

At some level, leased aircraft can be viewed as a physical asset or as a financial asset for the country hosting leasing firms. This distinction should not affect a robust measure of underlying economic performance. While the measurement of trade volumes is affected by this choice, GDP and GNI is not affected if a domestic firm purchases aircraft to lease out. If a stock of aircraft is transferred into domestic ownership, this can be handled in the same manner as the treatment of intellectual property outlined above.

## Conclusions

A supplementary measure of domestic resources should combine adjustments that allow for depreciation of foreign-owned domestic capital and the retained earnings of redomiciled firms. This can be simply calculated by subtracting the post-tax net operating surplus and the depreciation of foreign-owned domestic capital from GDP

$$GNI^* = GDP - PTNOS^{FOR} - CFC^{FOR} \quad (36)$$

## References

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