National Income Accounting
Econ 202/Haworth

In order to correctly measure the national output, we must first define what it is we are trying to measure. E.g., with the price level, we wanted to find the average price of a set of goods and services, and so we defined our price index measure in those terms. With national output, we want to get a measure of what we could call economic activity, the various transactions which occur within the economy that involve demanders and suppliers.

Our starting point is to create a measure we call **Gross Domestic Product** (or GDP) and our definition for GDP is as follows: GDP is the market value of all final goods and services produced in a given period within a nation's borders. Given what we learn from the circular flow model, we know that we can describe GDP as more than just the market value of all the output of final goods and services, we can also describe GDP as the sum of all income generated by producing those final goods and services within the nation's borders, or as the expenditure on those final goods and services.

Let's express GDP in terms of expenditure, and we'll put that expression in the form of an equation involving the different types of expenditure that make up the GDP.

$$GDP = C + I + G + (X - M)$$

where we define each of the variables below:

C = Consumption expenditure (i.e. spending on durable goods like cars, nondurable goods like food and services like the wonderful education you get here at UofL!)

I = Investment expenditure (i.e. spending on new homes, or residential investment, and business expenditure on capital – which includes buildings, equipment and machines)

G = Government expenditure (i.e. spending by all levels of government, from local to Federal government, on roads, police and fire protection, spending on the military, stimulus checks, etc)

X = export spending (i.e. anything we produce here that is purchased overseas by other countries)

M = import spending (i.e. anything we purchase here that is produced overseas by other countries)

What we actually include in these various categories is conditioned on what we are actually trying to measure. E.g., when we consider investment expenditure above, we note that business investment is the purchase of capital. When a firm buys capital, they may be expanding and are purchasing what we'll call new capital. In other situations, a firm may be replacing an existing unit of capital, something we could call depreciation expenditure. If investment includes both of these types of spending, then we refer to this as gross investment. If we deduct all depreciation from gross investment, then we have net investment, which some would say is a better measure

of investment spending. That also provides us with another way of looking at national output, where we have something called **Net Domestic Product** (i.e. NDP) provided below.

NDP = GDP – (depreciation expenditure)

Putting that another way, we could also relate GDP and NDP as follows:

GDP = C + Gross Investment + G + (X – M)
NDP = C + Net Investment + G + (X – M)

It's possible to refine our measure a little more. If we take NDP and deduct indirect business taxes, then we have **National Income** (i.e. NI).

NI = NDP – (indirect business taxes)

Indirect business taxes are any tax that is not levied directly on a firm's net income or profit. E.g., sales taxes may ultimately affect profit, but sales taxes are levied on the exchange of a good or service, which essentially involves taxing revenue – not profit (remember that profit is revenue minus costs, so profit and revenue are different).

If we are more interested in determining the income of persons, something we may want to do if we are looking at income differences across states instead of the nation as a whole, then we can calculate a measure called **Personal Income** (i.e. PI). PI is what you get when you take NI, add any income people have currently received, but did not currently earn (e.g. through a job), and then deduct any income people have currently earned, but not yet received.

PI = NI + (income received/not currently earned) – (income earned/not currently received)

One form of income that people may receive, but did not currently earn is a transfer payment. When government redistributes income (e.g. from rich to poor), those redistributive payments are called transfer payments. An example of income that one may have earned, but has not (yet) received is social security payments which are deducted from your paycheck as FICA.

When you consider what personal income represents, the easiest parallel is to think of the gross income you earn on a paycheck at work. Gross income is the amount you earn before taxes, and while that number may be quite large, we know that this number does not tell us as much about how much you have available to spend as your after-tax income or net income. In order to better understand the ability of people to buy goods and services, we can create another measure we'll call **Disposable Income** (i.e. DI), which we define as PI less any personal taxes.

DI = PI – (personal taxes)

Personal taxes are obviously the various types of income tax that individuals have deducted from their paycheck, income-based taxes by local, State and the Federal government.

If we go back to our original measure of GDP, then it's also important to note that this is not a measure we have always used to gauge overall national output. GDP replaced a former measure called Gross National Product (i.e. GNP). GDP began to be considered a better measure at one point, because the country began to experience more and more foreign direct investment. I.e. foreign companies increasingly began to start up within the U.S. Although these companies were not domestic firms, they still hired domestic labor and produced goods and services within our economy. As a result, the measure of GDP was created to reflect this output, and GNP was basically dropped.

As a measure, GNP was defined as the market value of all final goods and services produced in a given period by domestically owned factors. In other words, it didn't matter where the goods and services were produced, it only mattered (for US GNP) that the companies were U.S. firms. To better understand the difference between GDP and GNP, here's how they differ:

U.S. GDP includes output produced here in the U.S. by both foreign-owned and US-owned firms, but does not include any output by US-owned firms in other countries. Therefore, U.S. GDP includes Toyota production in Georgetown, KY, but not Ford production in Europe.

U.S. GNP includes output produced by US-owned firms here in the U.S., but does not include any output by US-owned firms in other countries or the output of foreign-owned firms here in the U.S. Therefore, U.S. GNP includes Ford production in Europe, but not Toyota production in Georgetown, KY.

Of course, Ford is a US-owned company, whereas Toyota is a Japanese-owned company.

Summarizing our measures from above, we have:

GDP = C + I + G + (X − M)
GDP = C + Gross Investment + G + (X − M)

NDP = GDP − (depreciation expenditure)
NDP = C + Net Investment + G + (X − M)

NI = NDP − (indirect business taxes)

PI = NI + (income received/not currently earned) − (income earned/not currently received)

DI = PI − (personal taxes)