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Valuing Timber Resource Stocks in the Canadian Natural Resource Stock Accounts

London Group, November 2013

Environment Accounts and Statistics Division

Statistics Canada

October 18th, 2013



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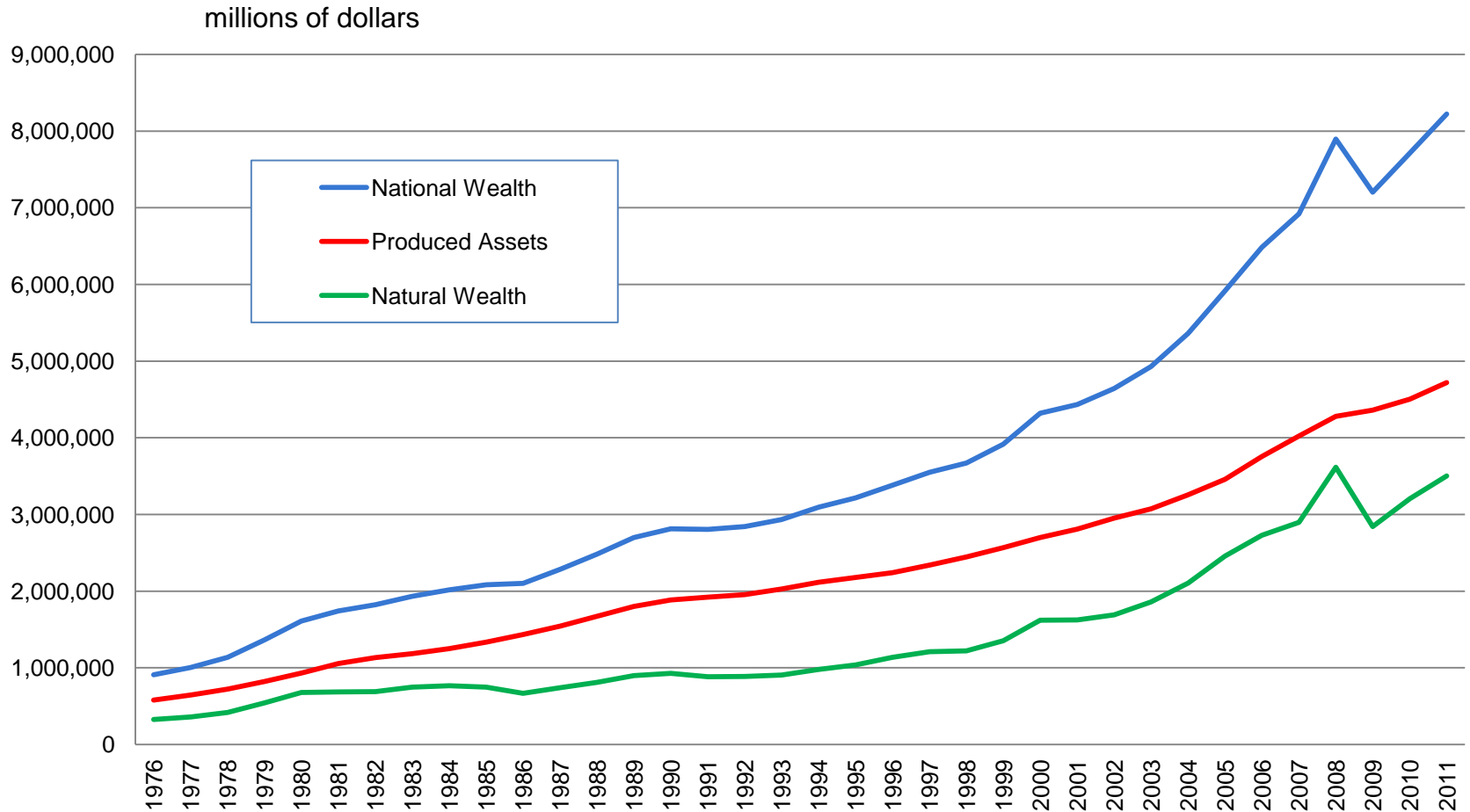
Quick facts

- Canada is home to 10% of the world's forest
- Forests cover approximately 45% of Canada's total land area. And 59% is considered capable of producing timber products

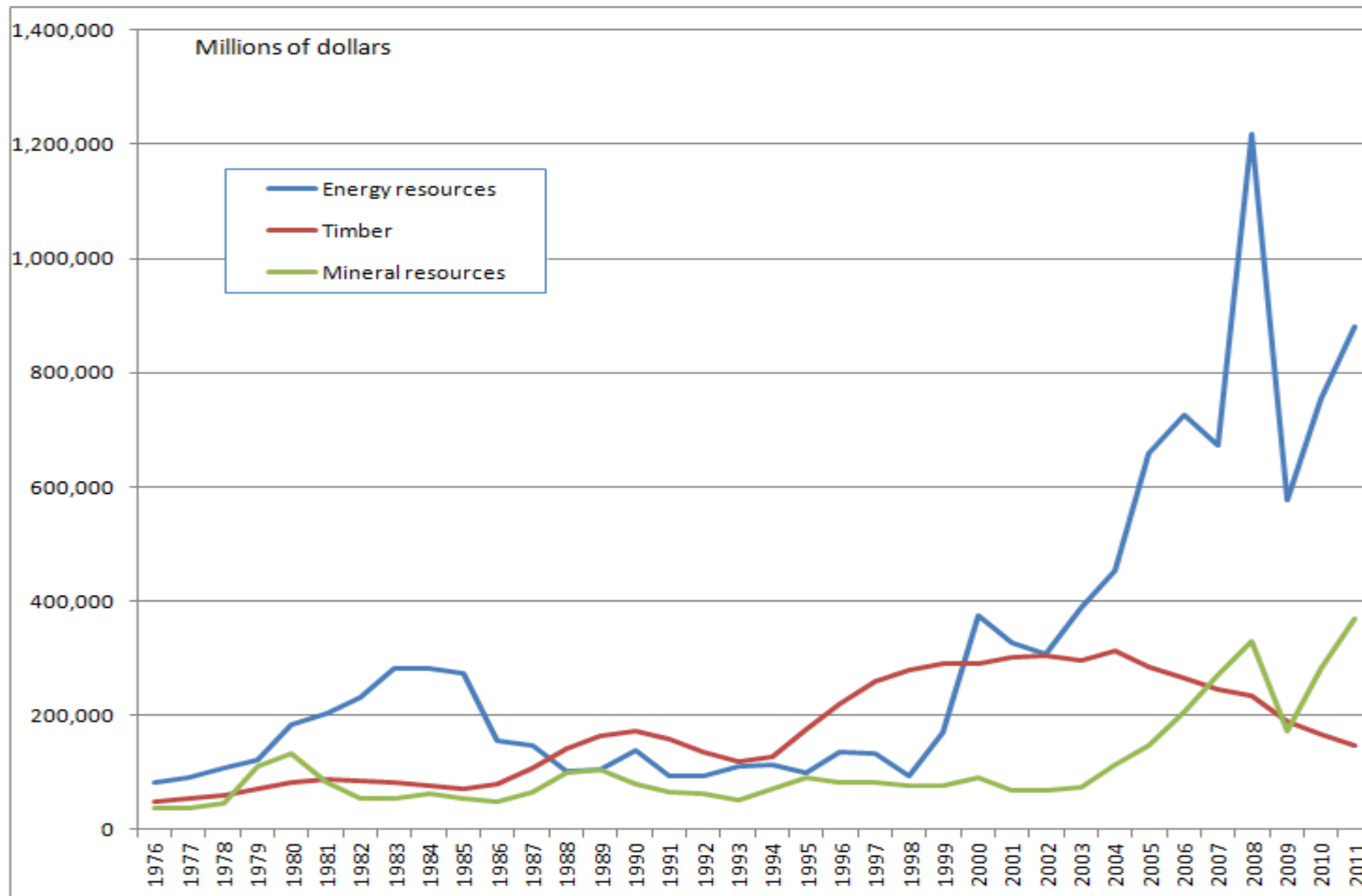
Background

- Development of estimates started with a pilot project for the province of Ontario in the late 1990s
- Was extended to the rest of Canada's provinces thereafter
- Timber stock values are included in Canada's National Wealth Account along with values of key energy and mineral stocks (chart next page)
- Presentation discusses the approach used to produce time series estimates of the value of Canada's timber resource stock and challenges faced

Natural wealth (incl. non-renewables, timber and developed land) and national wealth



Canada's natural resource wealth incl. timber wealth



Background . . SNA asset boundary

- The Timber Asset accounts value only resources that fit within the asset boundary of the SNA
 - ownership rights have been established
 - are commercially exploitable
- Excludes remote or protected forests
- Non timber benefits are not valued in the accounts
- Timber assets are recorded at their market value

As we will discuss today . .

- We consider only the commercially exploitable forest, which we value as a timber resource.
- Their value is based on the net income obtained from harvesting the timber (as we will see in more detail later)
- Accounts are not linked to an underlying physical account

The physical timber asset we value

- Commercially exploitable forest :
 - grown on accessible land where timber harvesting is allowed and trees of commercially valuable species grow to a merchantable size
- This target can changes over time
 - road building (+)
 - improved technology (+)
 - addition of protected areas (-)

Valuation . . . market prices exist?

- Ideally valuation of timber assets would be based on market transactions in these assets
- However such transactions (e.g. in timber rights) are rare in Canada
- Provincial governments (who hold the majority of forest lands) set allowable cuts based on sustainable yield ; they permit harvesting on limited scale
- *Could we use stumpage fees as a proxy price for timber value? No.*

Valuation . . . using resource rent?

- Given the lack of market data, the market value of timber assets must be estimated using indirect methods – based on resource rent.
- We calculate a rent residual, using data for annual production of the forest products industries
- Resource rent is equivalent to the revenue generated from resource extraction less all costs involved in bringing the resource to market
- Capital and operating costs are subtracted from the value of forest products produced

Valuation . . . using resource rent

- Annual forest management costs incurred by governments in maintaining the timber resource are also deducted in the calculation.
- Stumpage fees paid are left in as part of the residual (governments' share of resource rent)
- The annual rent obtained is the basis for valuation of the timber stock asset.

Valuation . . . using resource rent

- “Timber resource rent” represents the value of timber for in a single year only
- We estimate the value of the total stock of timber as the present value of the stream of rent expected from future timber harvests

Valuation . . . present value

- To facilitate this, we assume that both the rent value of recent harvests and the volume harvested are applicable to the remaining stock – i.e. harvest infinitely sustainable
- So the stock is valued as the present value of an infinite series of constant annual rent returns

Valuation . . . a note on pricing



- The selling price and cost data required to calculate annual rent are available for the logging industry.
- However, a large number of the logging establishments which report the data are part of integrated firms.
- These establishments do not actually sell timber to their parent mills, which means that the selling prices reported do not necessarily reflect market prices for timber (i.e. often a transfer price).

Valuation . . . a note on pricing



- If the reported selling price were too low, part of the rent would, in effect, be shifted to the buyer of the timber, so that a rent calculation based on the logging industry alone would be understated.
- To avoid the problem, we calculate rent for an industry group consisting of both the logging establishments and the secondary wood processing industries. These secondary industries are pulp and paper mills, veneer and plywood and sawmilling and planing.

Issues encountered . . assumptions

- Have always had to be transparent regarding required assumptions, i.e. :
 - Assume the harvest volume on which the rent is based is indefinitely sustainable.
 - The validity of this assumption has not been verified by a simulation of future harvests. If harvests were to be reduced in a not too distant future, the estimated stock values recorded in the MTAA would be too high.
 - The nature of the present value calculation is such that rents from harvests in the distant future are discounted to very low present values. Therefore, the possibility of reduced harvests in the distant future has little or no effect on the estimated stock value.

Issues encountered . . the data



- Capital stock data
 - Finding industry detail for the components of the forest products group has been challenging
- Data on forestry management expenses
 - Maintaining a consistent time series has been a challenge
- Provincial data sources
 - Maintaining quality of provincial data has been challenging ; current estimates are national level only

Issues encountered . . other

- Timeliness of data inputs
 - To match the publication schedule of the balance sheet , forward projection of annual data using sub annual indicators has been necessary. Subsequent revisions are benchmarked to the annual data sources as they become available
- Depletion value
 - Owing to the valuation approach, estimates of depletion are not possible – no direct link to an underlying physical stock model of timber supply
 - Currently considering options for a renewed physical timber stock account



Thank you – merci !