



**ECONOMIC COMMISSION FOR
EUROPE and
CONFERENCE OF EUROPEAN
STATISTICIANS**

**EUROPEAN FREE TRADE ASSOCIATION
STATE STATISTICAL COMMITTEE OF
UKRAINE**

Joint EFTA/UNECE/SSCU Seminar “Economic Globalisation: A Challenge For Official Statistics”

Kiev, 3-6 July 2007
Session 2 of the provisional agenda

**DATA ISSUES ON INTEGRATIVE TRADE BETWEEN CANADA AND THE US
MEASUREMENT ISSUES FOR SUPPLY CHAINS**

Prepared by Art Ridgeway¹, Statistics Canada

INTRODUCTION

1. Reduced barriers to the flow of capital, goods, and services, combined with rapid advances in communication and transportation technology, have for many years been fostering increased specialization of production activity, and this trend continues. The same factors have also led large firms, particularly multinational firms, to reorganize how they manage their operations. Firms are increasingly focusing on supply chain management and the choice between make or buy for intermediate inputs and, increasingly, service inputs. Within the make-buy decision are decisions on the location of supply, domestic or international.
2. These factors have also encouraged the development or emergence of a number of economies that are now growing rapidly by providing lower cost alternatives for many production activities. This includes the so-called BRIC countries (Brazil, Russia, India, and

¹ Director of the Balance of Payments Division of Statistics Canada. Views expressed in this paper are those of the author and not those of Statistics Canada.

China) and the eastern European economies. For example, China is now the second largest source of Canadian merchandise imports and Brazil is now one of Canada's top ten partner countries in both inward and outward foreign direct investment.

3. The organization of some multinational enterprises now exhibits a separation of the management of operations and the legal structure of the enterprise. Operations can be managed in units that cross multiple countries, while there are, necessarily, separate legal structures for each country. While this dual structure allows the enterprise to efficiently manage its operations and respond to regulatory and fiscal requirements, neither structure conforms to that required to produce economic data in support of policy. In addition, these structures increase the importance of intra-firm transactions where transfer pricing may be an issue.

4. A recent international study by a group of national statistical agencies that attempted to coordinate the collection of data for a sample of multinational enterprises revealed that these multinational enterprises are very sensitive about the confidentiality of their data. They were quite concerned with efforts to reconcile across countries how they reported to the participating statistical agencies.

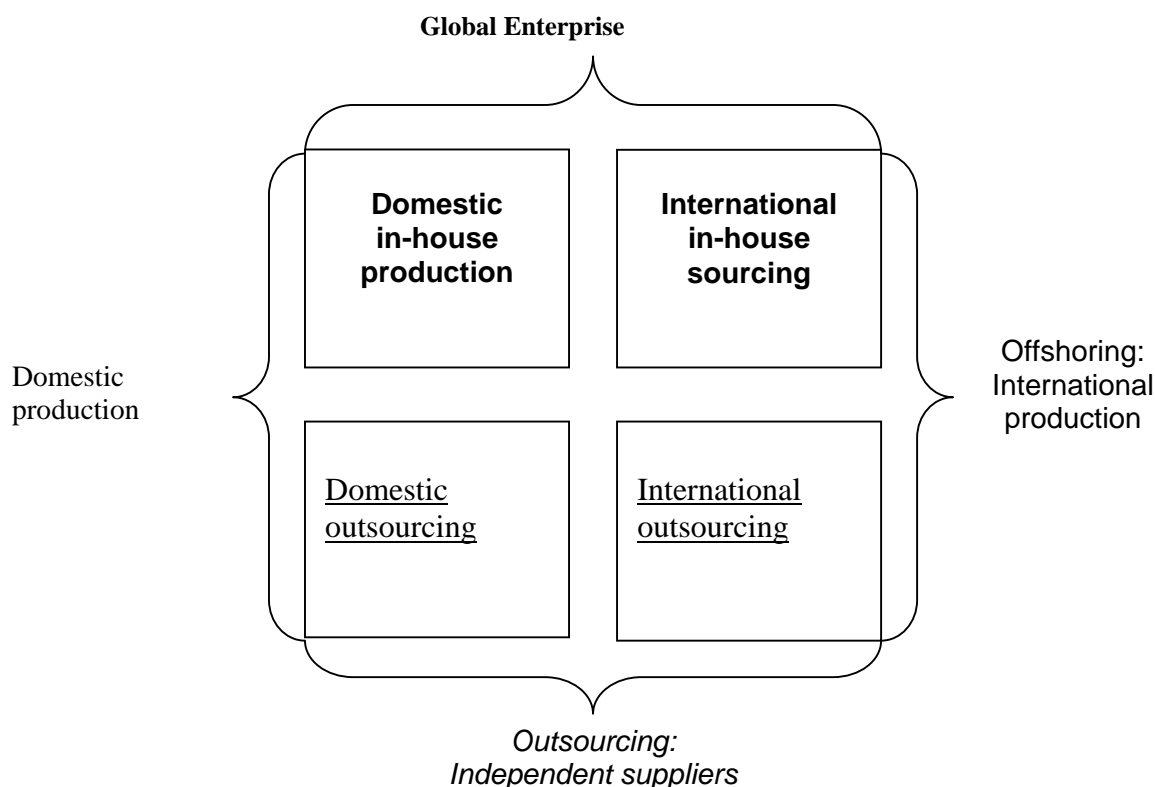
5. This paper looks at some of the implications of the globalization trend for economic statistics particularly with respect to the fragmentation of the production process and international trade. The annex provides a brief description of a range of statistical programs and current initiatives at Statistics Canada that are aimed at shedding light on the ongoing trend of globalization of production around the world economy.

IMPLICATIONS OF GLOBALIZATION TRENDS FOR ECONOMIC STATISTICS

6. These ongoing changes have led to the demand for new measures of economic activity and have affected how some traditional data series are gathered and interpreted. The drivers of the growth in globalization have been innovation and changing business structures and practices. Data on research and development activities have been available for many years, but more recently there have been demands for a broader set of data on innovation and the commercialization of new knowledge, and on the use of new electronic and other business practices. Statistics Canada's science, innovation, and electronic information program continues to evolve in response to these new demands.

7. In addition, there have been recent demands to directly measure the globalizing structural changes that are occurring. Offshoring is a phenomenon that users are seeking information on but that is not easily measured. Diagram 1 below presents a simple illustration of the relationship between the global enterprise, domestic production, outsourcing and offshoring.

Diagram 1. Global enterprises, production, outsourcing and offshoring



8. This diagram illustrates the broadest concepts of outsourcing and offshoring. Some analysts use these terms in a more restricted sense, defining them to refer just to those activities that have moved out of in-house or domestic production to independent or international production. Measuring outsourcing or offshoring events as defined by the narrow definition is very demanding, as this involves identifying decisions made at a specific point in time.

9. However, the most profound implications of increasing globalization may be in the challenges of measuring some of the core economic indicators. Moving productive activity out of the top left hand corner of the diagram to any of the three other quadrants implies that the ratio of gross flows to value added will increase. Factors that are increasing the measurement challenges include:

- the increasing value of service flows
- the increasing importance of flows internal to the global enterprise
- the increasing proportion of physical flows that are not coincident with changes in ownership

10. It used to be the case that when goods crossed borders they almost always changed ownership. This is no longer true. This separation of the ownership of goods and the cross-border flows in a multiple step production process is causing major valuation challenges. While there have been occasional instances of this for some time, the separation of ownership and production flows seems to be increasing. Collecting data from legal structures will generally reflect the ownership of resources whereas collection from operating units is more likely to reflect the operational flows of resources. While both are important for the full articulation of the economic data system, the reconciliation of data from the two separate structures is becoming

more difficult.

11. These challenges and the growing demand for new policy relevant data come at a time of declining response rates for many business surveys. Fortunately, the increased use of administrative data for 'simple' businesses has greatly reduced the burden for the small and medium end of the population, while allowing an improved coverage of these units. However, there are a few hundred of the largest enterprises in the country that account for a very large part of economic activity, and the deterioration in their rates of response to surveys is a concern. While declining response to surveys is not uniquely related to globalization *per se*, the fact that the non-respondents are often large globally oriented firms makes it difficult to get the data needed to measure globalization.

12. In addition, the growing importance of the emerging economies in Asia and South America pose challenges for bilateral comparisons as most of these countries have less well-developed statistical systems. Bilateral comparisons of data show large differences but, given the state of development of these statistical systems, it is difficult to assess the reasons for the discrepancies.

A. International efforts

13. International organizations have been active in expanding the conceptual basis for measuring activity related to globalization. The OECD *Technological Balance of Payments Manual* has been in use since its release in 1990. More recently, the OECD has provided the *OECD Handbook on Economic Globalisation Indicators* and the related publication, *Measuring Globalization: OECD Economic Globalisation Indicators*.

14. Other statistical manuals currently under revision will provide improved links to the new measures of globalization. In particular, the SNA manual,² the BOP manual,³ and the OECD Benchmark Definition of Foreign Direct Investment will have additional material on globalization. It has been announced recently that the manual on Statistics of International Trade in Services will also be updated to harmonize with the new material in the core manuals, including that on globalization. Statistics Canada has played a key role in all of these international developments.

15. Two of the most hotly debated issues addressed during the revision process concern the issue raised earlier where physical flows and ownership change are not coincident. The two issues are referred to as *goods for processing* and *merchandising*. The first deals with cases where goods enter a country for processing but the ownership is not transferred to a domestic producer. In merchandising a merchant buys goods, taking ownership, and sells them to a third party, but the goods never enter the merchant's country.

² For additional information on the updating of SNA 93 see United Nations National Accounts Section, Towards 1993 SNA Rev.1 <http://unstats.un.org/unsd/nationalaccount/snarev1.asp>

³ Additional information on the revision of the BOP Manual see Revision of the Fifth Edition of the IMF's Balance of Payments Manual <http://www.imf.org/external/np/sta/bop/bopman5.htm>

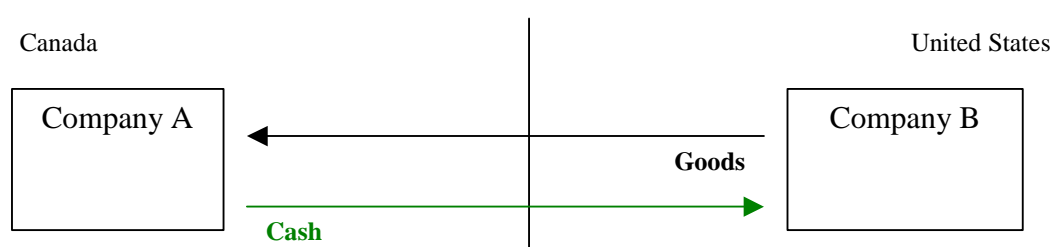
16. The Canadian response to these challenges is being developed as part of an overall plan to move the Canadian economic statistics program in line with the revised international manuals mentioned above.

B. Goods trade in a simple world

17. Goods dominate international trade. To start the exploration of measurement issues, take the simple case of the export of goods across the Canada–US border. There are two firms, one in Canada the other in the US, and one wishes to buy what the other produces. They agree on a contract, specifying the conditions of sale, and in due course the goods arrive at the customs frontier on the way from the seller to the buyer.

18. In this simple case depicted in Diagram 2 the exporter and the importer of record are the buyer and seller, and the customs documentation would show the flow of goods from one to the other. At the same time, or at least within a short period before or after the shipment, there would be funds transferred from the bank account of the buyer to the bank account of the seller.

Diagram 2. Traditional View of Goods Trade



19. It is a basic tenet of economic statistics such as the national accounts and the balance of payments that transactions should be based on exchanges of economic ownership.⁴ In this simple case the goods go from B to A and the money goes from A to B. Since the exact timing of the ownership change between A and B can vary depending on the contract and the payment agreement, as a proxy for change of ownership, economic statistics use the crossing of the customs frontier as the point at which the goods change ownership. It is assumed that this is a good proxy for the change of ownership.

20. It might be noted that there is no information here on what A is going to do with these goods from B. In the case of Canada and the US we know that often these goods will be used as intermediate inputs in other goods that in turn will go back across the border to the US.

21. In this simple case, if the industrial activity of each of A and B is known and the location of their business is known, one can build up trade data showing to/from information on a geographic and an industry basis.

22. The real world, of course, has never been quite that simple, as often transactions are

⁴The term economic ownership is used to differentiate it from legal ownership, which is generally the same but can differ in cases such as financial leases.

handled via brokers who may affect the timing of certain transactions or at least the recording of transactions. In addition, the timing of payment may vary more widely, and so a debt may be recognized between the supplier and the buyer, which is eliminated as the goods are paid for or delivered if prepaid.

23. The simple fact of inserting a broker can already cloud the analysis of the data as the customs documentation may well show the industry and location of the broker as one of the transactors and the capacity to undertake industry and geographic analysis is weakened.

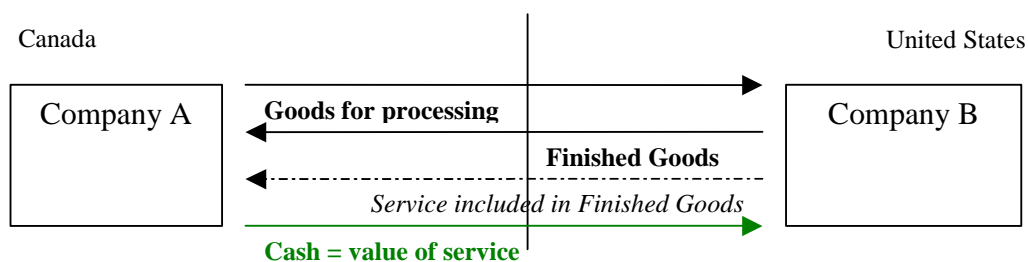
24. The buyers and sellers may be owned by the same owner and thus part of a multinational enterprise. The ownership link is likely to affect the stability of the commercial relationship, but it may also affect the prices of the transactions that are recorded.

25. The customs data used to measure the great majority of trade in goods between the US and for that matter most countries, is still largely based on this simple model. We assume that the goods change ownership as they cross the border and that the value of the goods declared to the customs officials is a proper market valuation of the goods worth.

C. Goods for processing

26. The first deviation from this simple model to be explored in this paper is that of goods for processing. As noted earlier, this is not a new phenomenon as examples have existed for decades but there is evidence that the volume of goods traded under this scenario is growing rapidly.

27. The basic change in the model here is that the goods do not change ownership as they cross the border but the contract between A and B now stipulates that the goods are to remain the property of A but that B will perform some specified processing of the goods and then send them back to A. This type of processing may be between enterprises under common ownership or enterprises operating at arms length. A will pay B a service fee for this processing.



28. In this scenario the customs process records these goods but they are generally not distinguishable from other goods crossing the border. There must also be a value declared for these goods.

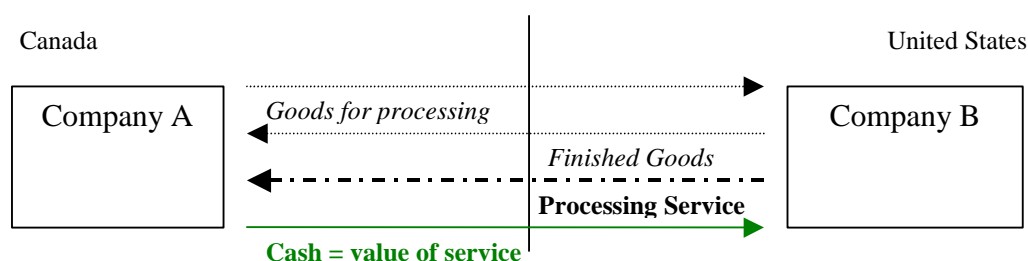
29. However, the counterpart financial transaction between A and B will be greatly different than if ownership had actually changed as the goods moved between them. In this case only the value of the service will flow from A to B, which will correspond approximately to the net difference between the values declared to customs for the import and the export.

30. The current treatment of these situations in the economic accounts is to record these goods as if they had changed ownership as they cross the border. The full value of the goods is entered into the trade data in both directions and corresponding financial flows are recorded. The service provided by the processor is buried in the value of the returning goods.

31. This treatment corresponds well to the construction of supply and use tables such as the Canadian I-O Accounts but does not shed light on the evolving behaviour of business activity and is not in keeping with actual financial flows.

32. During the recent international efforts to update the conceptual guidance for the System of National Accounts and the Balance of Payments, it has been decided that the guidance on these types of transactions will be changed to correspond to the ownership principle. While the goods flowing both ways will continue to be included in the customs data, the convention will be to remove these values from the Balance-of-Payments-based trade data used in the BOP and SNA. Instead the service flow and corresponding payment will be reflected in the accounts.

Diagram 4. Goods for Processing – New International Convention (SNA & BOP)

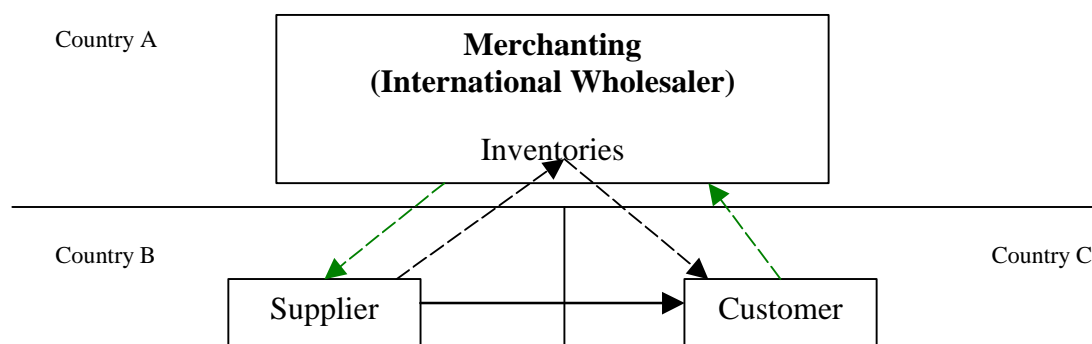


33. This would require that there be data to differentiate these cross-border flows of goods from traditional transactions. The customs data do not as yet provide such information. The service flows will have to be measured using surveys as there are no administrative sources for these data.

D. Merchenting

34. The new world of production can also have instances of what is referred to in the statistical manuals as “merchanting.” Other terms might be international trading or international wholesaling. This is the case where an enterprise in country A buys goods in country B but the goods never enter country A but are sold on to country C.

Diagram 5. Merchanting – International Convention



35. While the ownership of these goods moves from B to A and then from A to C, the customs data will record only a flow from B to C. These supplies will enter into the inventories of the merchant in country A. Surveys of wholesale activity will record these inventory changes and given there have been no imports recorded, the economic accounts will look for domestic production, which of course is not there, to balance out the supply use accounts.

36. The revised BOP and SNA conventions call for the imputation of flows into and out of country A in line with the ownership changes. It may be practical to develop surveys in country A to gather information from the merchant and may be worthwhile if sufficient activity is present in the country that would distort the signals from these inventories owned outside the country. However, the benefits of collecting additional data on these transactions for countries B and C are much smaller and it is unlikely that they will adjust their data, thus leading to discrepancies in bilateral trade data.

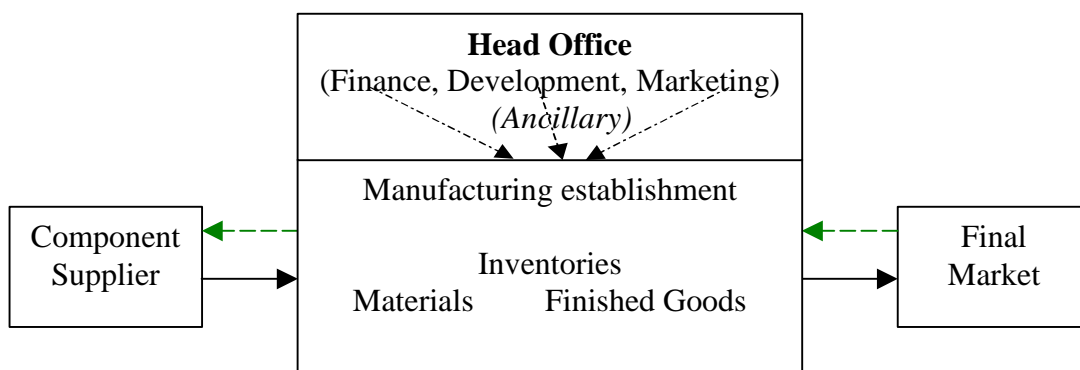
E. Goods Production

37. The goal is to have economic statistics for both production and trade that are consistent and thus provide information to policy makers and Canadians in general on how these aspects of the Canadian economy are developing. Therefore, before turning to look specifically at challenges faced in measuring trade in goods in more fragmented production processes, it may be helpful to review for a moment the traditional way the manufacturing production process is viewed in measuring economic statistics.

38. Diagram 6 provides a simple case of a producer of goods. The example here has one manufacturing establishment with a separate head office. The head office provides the financing, product development, and marketing, while the manufacturing establishment acquires the other inputs, manages the inventories, and produces finished goods for market.

39. In the model, please note that the activities/outputs of the head office are considered ancillary services provided to the manufacturing establishment.

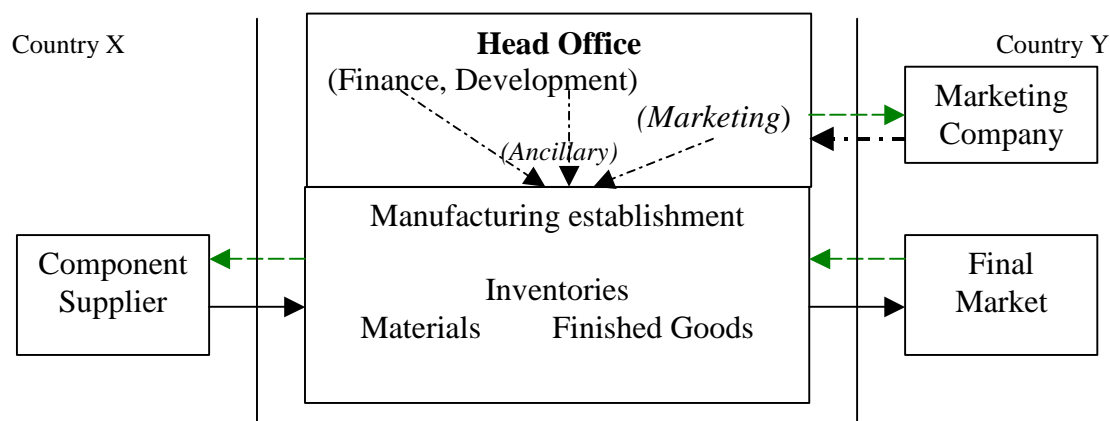
Diagram 6. Traditional View of Goods Production



40. The model can explicitly be extended to include trade in goods and services as in Diagram

7. Note that if some of the services provided by the head office in the previous example are outsourced, then they are still treated as being supplied through to the manufacturing establishment.

Diagram 7. Traditional View of Goods Production with Trade in Goods and Services



F. Outsourcing of the Goods Production

41. Diagram 8 provides an example with outsourcing of the procurement of input materials and the manufacturing process. In this case, all of the goods produced are “exported” to a country other than that of the head office or manufacturing plant. One could think of this as a case of line of products produced only for an export market.

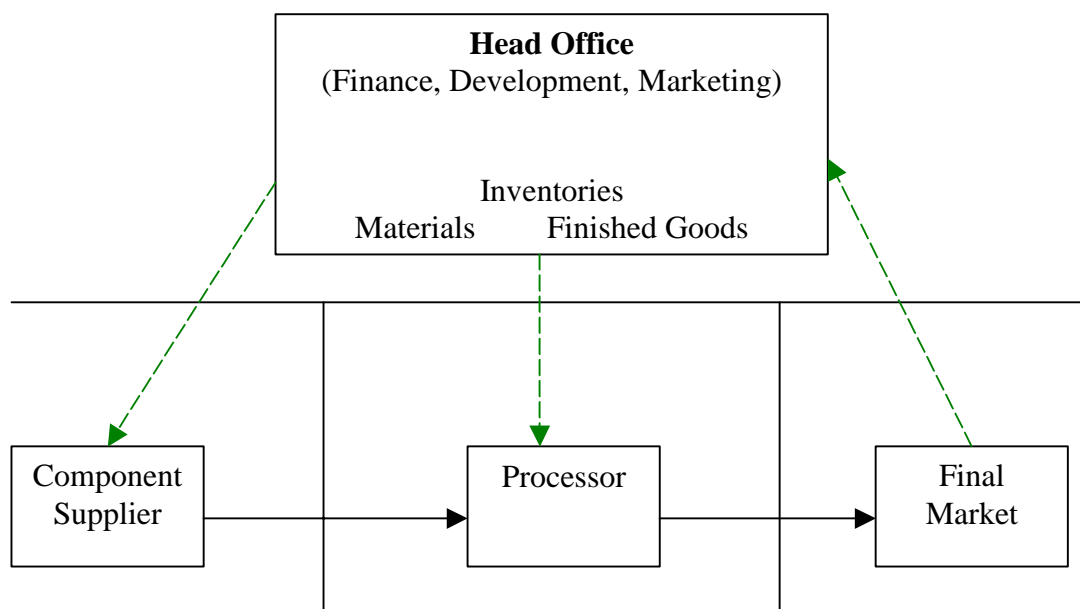
42. In this example the head office and the manufacturing plant are no longer in the same economy and are two separate enterprises. The head office still produces the financing, product development, and marketing but acquires all other inputs from outside the country. In this case, the head office enterprise buys all of the material inputs and has them sent to the establishment of the processor to be assembled. The head office maintains ownership of these materials as in the goods for processing case discussed earlier. Therefore, while processing may all take place outside of the country of the head office, it is the head office that bears the financial risks associated with carrying these inventories throughout the production process. This case also has elements of the merchanting case discussed earlier, as the head office acquired the ownership of these materials but they never physically enter the country, thus never appear in the customs data.

43. There are two important differences from the traditional view of the producing enterprise that should be noted:

- Inventories of materials and finished goods have moved from the manufacturing establishment to the head office.
- The services produced by the head office – finance, product development, and marketing – are no longer supplied to the manufacturing establishment.

44. In Diagram 8 the flows of goods and payments are indicated. It is clear immediately that the path followed by the cash to pay for these transactions does not correspond to the path followed by the goods themselves. Again this is similar to the merchanting example.

Diagram 8. Outsourcing Production for Export market – Flows of Goods and Cash



45. Using the principles noted earlier about ownership as a basis for recording, Diagram 8 indicates how economic data might be recorded to reflect the economic activities rather than the physical supply-use activities of this production process.

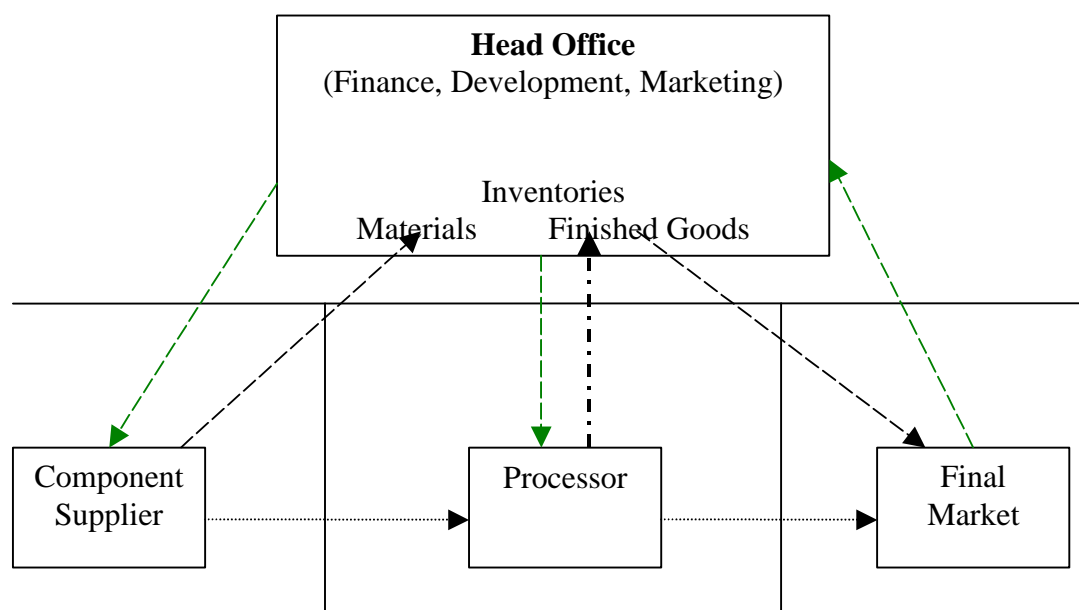
46. The purchase of materials would be shown as a transaction between the head office and the component supplier. The processing services would be supplied to the head office. The final sales of finished goods would be transactions between the head office and the final market economy.

47. The implication of this presentation of the economic data is that the head office, even though it has no manufacturing facilities or warehousing facilities, is the producer of the finished goods. While this does not correspond to the physical flow of the goods, it does recognize the behaviour of the economic agents in this situation. It is the head office that is undertaking the economic decisions that govern production, whereas the processor is offering a specific service only.

48. Ideally, to be consistent with this recording of production and trade, the bottom three countries in Diagram 9 would remove the goods flows from supplier to processor and on to final markets from each of their accounts.⁵ However, as with the merchanting case described earlier, the information to undertake such adjustments may be difficult to obtain.

⁵ Information on physical flows will still be important for economic development as infrastructure requirements are determined by these physical flows.

Diagram 9. Outsourcing Production for Export market – Economic Flows



G. Measurement Issues for Goods and Services Trade

49. Diagram 9 shows four different countries. Canada can have enterprises that correspond to those shown in each of the countries. That is, we face the measurement challenges depicted in each of the four fictional countries. This section will take a brief look at the challenges in measuring the activity of each of the four enterprises.

50. Starting with the component supplier, the challenge is the geographical allocation of trade. The customs data will indicate the country of the processor while if we ask the supplier, the response would be the head office country. Surveys of goods producers such as this supplier ask for little on the geographic distribution of sales of goods, particularly for sales outside the country. This is, of course, because the customs data are used to provide this information. While value-added data will be correct, the information on trade patterns available to trade policy analysts and negotiators will be affected by how these transactions are measured.

51. Turning to the country of the processor, the information on the transactions between the processor and the head office will have to be collected by survey. Up to now in Canada these cases have been handled on a case-by-case basis, with special reporting arrangements set up with processors. It is not possible to identify the customs records associated with this processing activity and it is unlikely that this would change in the near future. If this activity is limited to a few large players, this case-by-case treatment can be used, but if it becomes (or already is?) more widespread, then this approach is too costly to be applied to a large number of cases.

52. The case of the final market economy is similar to that of the supplier country, in that the geographical allocation of supply based on the customs data and survey data would differ. Surveys of wholesale and retail firms importing goods do not ask for details on the geography of supply. There may also be a valuation difference if the value of imports declared for customs

purposes does not correspond to the full value of the purchase price paid to the head office. Reconciliation of these values will only occur at a macro level in constructing the economic accounts.

53. The large challenge with measuring the economic activity of the head office is that surveys must be used to collect a lot of detail on the goods and service inputs and outputs of this enterprise. Collecting detailed commodity and geographical information using surveys is very burdensome on the respondent. However without sufficient detail on these commodities, it will be difficult to distinguish the traditional manufacturing operations from those which have outsourced significant parts of the production process.

H. Country of Origin and Ownership

54. Customs officials collect data on the “country of origin” of the product, which is based on customs rules for imports and the country of destination for exports. Also collected is the point of shipment. This transfer process also means that the shipper (exporter) may not know the ultimate destination of the goods, whereas the importer generally knows the country of origin due to the rules of origin.

55. This can result in significant differences in the bilateral trade figures for some country pairs. For example, Mexico reports about twice the value of imports from Canada as we report exports. The difference is largely goods that the exporter declares as going to the US but that are just passing through.

56. The case is similar for Chinese goods entering Canada. About half of the Chinese imports on a country-of-origin basis arrive in Canada having a point of shipping of either Hong Kong or the US.

57. If ownership is to be a fundamental basis for economic statistics, the question arises as to which of the geographical data on the customs record – country of origin or country of shipment – is the best indicator of the counterparty to the transaction. Are the Chinese goods transiting through the US on their way to Canada simply just ‘in transit’ or are they being acquired by an entity in the US which then distributes them (sells them) to a network of North American outlets?

I. Services trade

58. Services trade is still the poor cousin but, as seen in earlier examples, fragmentation and reorganization of the production chain may be leading to significant increases in the relative shares of services trade. In the ‘good old days’ as it were, services were less of a concern. It was assumed that most services had to be produced and consumed at the same time so that the international trade in services was limited.

59. The ease with which producers can travel to other parts of the world and the advances in electronic delivery of many products has certainly changed the potential for international trade in services. In simple volume terms it is still much smaller than goods trade but services trade has seen much greater rates of growth for a number of years now.

60. The other point that is likely clear by now is that there is a growing fussiness about the differentiation of what a good is and what a service is. Thus, any exercise that is forward looking should cover both.

61. There are of course no customs documents for services.⁶ The data for services trade generally come from business surveys. This measurement approach has very different strengths and weaknesses from the administrative process (customs) used for goods.

62. In general, businesses can more readily respond to surveys on their sales rather than purchases of inputs, particularly if one is asking about the geography of the transaction and the industrial activity of the counterparty. Whereas for goods the import data are generally of better quality, as customs administrations are more diligent about collecting duties owed and due more recently to security concerns, trade in services is better at measuring exports.

63. The use of surveys also limits the amount of detail on geography and commodity detail for services transacted, since asking for very specific detail on the service provided and the location of the counterparty rapidly becomes a very large burden for the respondent.

J. Cross-border valuation and transfer pricing

64. While a significant proportion of international trade has for some time been between affiliated enterprises, it is difficult to identify these trade flows separately due to the use of brokers and other agents. It has been recognized that intra-firm transactions may reflect transfer pricing and thus affect the valuation of economic activity between economies.

65. The customs 'transactions' depicted in Diagram 3, even if they are with non-affiliated parties, may not reflect arms-length measures of economic valuation as the actual transaction taking place is for a service but the valuations that are being declared, and currently used in economic accounts, are for the goods crossing the border. It is generally assumed that the difference between the value of the goods entering for processing and those returning are equal to the contracted service from the processor.

66. The customs flows in the scenario in Diagram 9 are also displaced from the actual economic transactions with the customs values both entering and exiting the country of the processor, presumably based on the accounts of the head office.

67. If values declared for customs purposes are not the same as the actual transaction values then the difference will distort measures of economic activity.

⁶ Customs documents are used to develop estimates of transportation services for the delivery of internationally traded goods.

K. Structural vs. Behaviour-Based Economic Data

68. A complete picture of the Canadian economy requires data on both the structural aspects of our economy and the behavioural aspects. The national accounts address the need for structural data primarily via the supply-use tables and the structural data published by individual surveys such as the annual survey of manufacturing. The behavioural data is primarily delivered via the sector accounts of the national accounts and related sector-specific data from programs such as those in the Balance of Payments and Public Institutions Divisions.

69. There is evidence that the organization of production and trade is changing. The challenge for the statistical system in part is to decide when these changes are sufficiently important to change the basic focus of the accounts and underlying surveys. To refocus the statistical system and move away from the traditional models used as the foundation of the economic data would be very costly.

70. The costs to adjust to a different focus are not only those that the statistical agency will have to bear but also those imposed on respondents if surveys are expanded. Significant changes to the model underlying data production may also cause discontinuities in some data series that will challenge analysts' capacity to understand the evolution of the economy. Of course remaining with the current model may obscure structural changes underway in the economy raising challenges for analysts.

CONCLUSION

71. There are clearly cases of each of the different models of economic activity discussed in this paper in the Canadian economy. What is less clear is the proportion of activity that falls into these different scenarios. The challenge for the statistical system is to find ways to measure these emerging phenomena in a manner that is cost efficient in terms of both response burden and budget. Given resource constraints, which activities — for example, goods for processing, merchanting, trade services — should perceive priority for development?

72. Consultation with policy makers, business respondents, academics, and other analysts will be important in mapping a way forward to address these important challenges. At the same time the statistical system needs to keep in step with international statistical developments if Canada is to have measures of economic activity that are comparable across countries.

REFERENCES

International Monetary Fund. 1993. *Balance of Payments Manual. Fifth Edition, 1993*. Washington, DC. International Monetary Fund.

United Nations, Commission of the European Communities, International Monetary Fund, Organization for Economic Co-operation and Development, and World Bank. 1993. *System of national accounts 1993*. Series F, no. 2, rev 4. New York: United Nations.

Wilson, Karen. 2006. The Architecture of the Systems of National Accounts, A Three-Way International Comparison of Canada, Australia and the United Kingdom. In *A New Architecture for the U.S. National Accounts*, ed. Dale W. Jorgenson, J. Steven Landefeld, and William D. Nordhaus, 113-142. Chicago: The University of Chicago Press.

* * * * *