

Overview Report: Quantification of Money Laundering

A. Scope of Overview Report

1. This Overview Report is about estimating the extent of money laundering. As quantification is the most common means of understanding the extent of the problem, this Report is primarily focused on describing the various methodologies used to date to quantify money laundering, including their strengths and weaknesses. This Report also summarises three reports commissioned by the Government of British Columbia and two RCMP investigations, which all at least touch on the question of the extent of money laundering in this province.

B. Introduction

2. Various methods to determine the extent of money laundering have been proposed. However, despite concerted effort by a number of economists and criminologists, there is still no consensus on which methodology, if any, can be relied on to realistically estimate the extent of money laundering domestically and/or globally.

C. Why try to estimate money laundering?

3. Because money laundering takes place secretly and occurs unobserved, all of the literature reviewed agreed that the adequacy of the different measurement models is difficult to assess.¹ Some have even said estimates and extrapolations of money laundering remain wild and imprecise, if not downright wrong² or it is not possible on any evidence to improve on an order of ten estimate range.³ According to Van Duyne et al.:

¹ See e.g. J. Ferwerda, M. Kattenberg, H.-H. Chang, B. Unger, L. Groot and J.A. Bikker, "Gravity models of trade-based money laundering", (2013) 45 Applied Economics 3170 at p. 3170; V. Tanzi, "Macroeconomic Implications of Money Laundering" in *Responding to Money Laundering: International Perspectives*, E.U. Savona ed. (United Kingdom: Harwood Academic Publishers, 1997) at p. 93.

² P.C. Van Duyne, J.H. Harvey, L.Y. Gelemerova, *The Critical Handbook of Money Laundering: Policy, Analysis and Myths* (London, Palgrave Macmillan, 2018) at p. 6. See also e.g. P. Reuter, "Are estimates of the volume of money laundering either feasible or useful?", *Research Handbook on Money Laundering*, B. Unger and D. van der Linde, eds. (Cheltenham, UK: Edward Elgar, 2013) at pp. 224 and 227.

³ M. Gold and M. Levi, *Money-Laundering in the UK: An Appraisal of Suspicion-based Reporting* (London: The Police Foundation / University of Wales, 1994) at p. 42.

The history of anti-money laundering that has been mapped out over the preceding 25 or so years is one that has been more supported by righteousness than by empirical facts. We observe a tendency to recycle data without proper testing or searching for original sources.⁴

4. The problems with money laundering estimates have led experts to opine that the methodologies used to quantify money laundering are so flawed as to be entirely unhelpful for guiding policy.⁵ For example, Peter Reuter says that knowing how much money is laundered serves no important policy purpose because there is no prospect in either surveys of experts or in studies of crimes themselves, as reflected in criminal justice statistics, for developing persuasive estimates.⁶

5. Given the criticisms—and universal acceptance that estimates cannot be verified for accuracy—why should the Commission try to estimate money laundering at all? First, our Terms of Reference require inquiry into the extent and growth of money laundering in British Columbia in certain sectors.⁷ Second, the Commission must come up with recommendations to address the problem of money laundering. Without some boundaries on the scope of the problem, recommendations would be made in a vacuum. Third, government and agency decisions to implement recommendations must have some basis on which to justify implementation (or not) or prioritisation of what to

⁴ P.C. Van Duyne, J.H. Harvey, L.Y. Gelemerova, *The Critical Handbook of Money Laundering: Policy, Analysis and Myths* (London, Palgrave Macmillan, 2018) at p. 10.

⁵ P. Reuter and E. Truman, *Chasing Dirty Money: The Fight Against Money Laundering*, Institute for International Economics, Washington, D.C., 2004 at p. 10, available online at: <https://books.google.ca/books?id=0AVwjC9TDSMC&printsec=frontcover&dq=chasing+dirty+money+google&hl=en&sa=X&ved=0ahUKEwjN1eKcncDmAhWTqZ4KHTAZC34Q6AEIKTAA#v=onepage&q=chasing%20dirty%20money%20google&f=false>; P. Reuter, “Are estimates of the volume of money-laundering either feasible or useful?”, *Research Handbook on Money Laundering*, B. Unger and D. van der Linde, eds. (Cheltenham, UK: Edward Elgar, 2013) at p. 224.

⁶ P. Reuter, “Are Estimates of the Volume of Money Laundering either Feasible or Useful? Comments on the presentation by John Walker”, 2007, available online at: <http://www2.econ.uu.nl/users/unger/papers/Reuter2.pdf>.

⁷ *Commission of Inquiry into Money Laundering in British Columbia Order*, section 4(1)(a), available online at: <https://cullencommission.ca/about/#tor>.

implement. Fourth, without a measurement baseline it will be impossible to review the effectiveness of steps taken to address money laundering.

6. Estimates might give us a sense of the minimum bounds and/or the order of magnitude of the problem, which could help assess whether the phenomenon in different sectors warrants public policy attention.⁸ While specific numbers may be inaccurate, estimates based on one or more of the methods below may at least offer reference points as opposed to providing a conclusive value for the scale of money laundering.⁹

D. What methods are there to quantify money laundering?

7. As noted above, by definition, money laundering is an attempt to legitimise the proceeds of illegal activities so measurement of the actual amounts laundered is very difficult. Any attempt to quantify the activity will therefore always be via some kind of proxy measurement.

8. The literature categorises estimation methods in different ways (e.g. macroeconomic or microeconomic, direct or indirect, top down or bottom up). In this Report, quantification methodology is grouped as follows:

1. unverifiable International Monetary Fund “consensus” range of 2-5% of global gross domestic product (“**GDP**”);
2. extrapolations from capital mobility data and discrepancies;
3. extrapolations from measurements of the shadow or underground economy, including:

⁸ P. Reuter and E. Truman, *Chasing Dirty Money: The Fight Against Money Laundering*, Institute for International Economics, Washington, D.C., 2004 at p. 10, available online at: <https://books.google.ca/books?id=0AVwjC9TDSMC&printsec=frontcover&dq=chasing+dirty+money+google&hl=en&sa=X&ved=0ahUKEwjN1eKcncDmAhWTqZ4KHTAZC34Q6AEIKTAA#v=onepage&q=chasing%20dirty%20money%20google&f=false>.

⁹ FinTRAC, “Estimating the Scale of Money Laundering in Canada”, 2015 (redacted).

- a. Currency Demand approach;
 - b. discrepancy between indicators of overall economic activity and official GDP;
 - c. Dynamic / Multiple-Indicators Multiple Causes approach;
 - d. Two Sector / General Equilibrium model;
4. extrapolations from suspicious transaction reports or other indicators of potential money laundering;
 5. extrapolations from proceeds of crime data, including:
 - a. case studies; and
 - b. Walker and Unger gravity models.¹⁰

These methods are summarised below.

E. The unverifiable International Monetary Fund “consensus” range of 2-5% of global GDP

9. A number oft-repeated in various agency reports and in the literature is that money laundering is 2-5% of global GDP.¹¹ It is sometimes referred to as the “IMF 1998 estimate”. The figure comes from a 1998 speech in Paris made by Michel Camdessus,

¹⁰ Appendix A has a table listing the above categories, other categorisations and the primary people or agencies associated with each method.

¹¹ See e.g. M. Arnone and L. Borlini, “International anti-money laundering programs: Empirical assessment and issues in criminal regulation”, (2010) 13 *Journal of Money Laundering Control* 226 at p. 233; P.C. Van Duyne, J.H. Harvey, L.Y. Gelemerova, *The Critical Handbook of Money Laundering: Policy, Analysis and Myths* (London, Palgrave Macmillan, 2018) at p. 8; N. Hendriyetty and B.S. Grewal, “Macroeconomics of money laundering: effects and measurements”, (2017) 24 *Journal of Financial Crime* 66 at p. 71; W.A. Khan, S.T. Jawaid and I. Arif, “Where does a nation’s wealth go? Evidence from a third world country”, (2018) 21 *Journal of Money Laundering Control* 426 at p. 437; F. Schneider, “The Financial Proceeds of Transnational Organized Crime All Over the World: Some New Empirical Facts”, (2013) 33 *SAIS Review of International Affairs* 91 at p. 92.

the then Managing Director of the International Monetary Fund (“IMF”).¹² Mr. Camdessus was addressing the Financial Action Task Force (“FATF”) plenary meeting.¹³ The methodology used to get this estimate has never been shared, but the estimate is frequently used as a default reference point by various authoritative bodies, including The World Bank.¹⁴ The Criminal Intelligence Service Canada applied it in 2014 to get an estimate of money laundering in Canada.¹⁵

10. In addition to lacking any verifiable methodology, the applicability of this estimate to the domestic context as well as the fact that it is out-of-date regarding today’s world economies and financial crime led the Financial Transactions and Reports Analysis Centre of Canada (“FinTRAC”) to reject it as a viable way to measure money laundering.¹⁶

F. Extrapolations from capital mobility data and discrepancies

11. There are several methods for estimating the extent of money laundering that use capital mobility data. These are top down approaches based on analyses of statistical discrepancies. All approaches have data limitations and problematic assumptions.

¹² M. Arnone and L. Borlini, “International anti-money laundering programs: Empirical assessment and issues in criminal regulation”, (2010) 13 *Journal of Money Laundering Control* 226 at p. 233; FinTRAC, “Estimating the Scale of Money Laundering in Canada”, 2015 (redacted) at p. 1; United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 19, available online at:

<https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>; J. Walker and B. Unger, “Measuring Global Money Laundering: ‘The Walker Gravity Model’”, (2009) 5 *Review of Law and Economics* 821 at p. 823.

¹³ International Monetary Fund, SPEECH, Address by Michael Camdessus, February 10, 1998, available online at: <<http://www.imf.org/external/np/speeches/1998/021098.htm>>. The FATF is an inter-governmental body established in 1989 by the Ministers of its Member jurisdictions. Its objectives are to set standards and promote effective implementation of legal, regulatory and operational measures for combating money laundering, terrorist financing and other related threats to the integrity of the international financial system.

¹⁴ FinTRAC, “Estimating the Scale of Money Laundering in Canada”, 2015 (redacted) at p. 1.

¹⁵ FinTRAC, “Estimating the Scale of Money Laundering in Canada”, 2015 (redacted) at p. 1.

¹⁶ FinTRAC, “Estimating the Scale of Money Laundering in Canada”, 2015 (redacted) at p. 2.

Hot Money method

12. The Hot Money method relies on net errors and omissions in countries' balance of payments and recorded capital outflows from the private sector.¹⁷ Errors and omissions are thought to reflect differences in registered capital inflows and outflows.¹⁸ The approach assumes that errors and omissions arise because of a failure to measure certain movements of private, short-term capital and so reflect unrecorded capital outflows such as transactions with off-shore centres and bogus transactions and invoicing.¹⁹ The theory underlying the approach is that the higher the errors and omissions in balance of payment accounts, the more likely the country can become a victim of money laundering.²⁰

13. The primary drawback in using this method is that errors and omissions data also capture statistical errors in balance of payments that are difficult to separate from unrecorded capital flows.²¹ Also, Hot Money estimates of illicit flows only capture a small portion of illicit flows.²² There are also data limitations because errors and

¹⁷ N. Hendriyetty and B.S. Grewal, "Macroeconomics of money laundering: effects and measurements", (2017) 24 *Journal of Financial Crime* 66 at p. 72; D. Kar and D. Cartwright-Smith, *Illicit Financial Flows from Developing Countries: 2002 – 2006*, Global Financial Integrity, December 2008, available online at: <https://secureservercdn.net/45.40.149.159/34n.8bd.myftpupload.com/wp-content/uploads/2014/05/IFFs_from_Developing_Countries_Report-Full-Economist-Final.pdf?time=1576152230> at pp. 4-5.

¹⁸ United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 16, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

¹⁹ United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 16, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

²⁰ N. Hendriyetty and B.S. Grewal, "Macroeconomics of money laundering: effects and measurements", (2017) 24 *Journal of Financial Crime* 66 at p. 72; United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 16, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

²¹ N. Hendriyetty and B.S. Grewal, "Macroeconomics of money laundering: effects and measurements", (2017) 24 *Journal of Financial Crime* 66 at p. 72; D. Kar and D. Cartwright-Smith, *Illicit Financial Flows from Developing Countries: 2002 – 2006*, Global Financial Integrity, December 2008, available online at: <https://secureservercdn.net/45.40.149.159/34n.8bd.myftpupload.com/wp-content/uploads/2014/05/IFFs_from_Developing_Countries_Report-Full-Economist-Final.pdf?time=1576152230> at p. 5.

²² N. Hendriyetty and B.S. Grewal, "Macroeconomics of money laundering: effects and measurements", (2017) 24 *Journal of Financial Crime* 66 at p. 72; D. Kar and D. Cartwright-Smith, *Illicit Financial Flows from Developing Countries: 2002 – 2006*, Global Financial Integrity, December 2008, available online at:

omissions data are missing for many countries, which drives down estimates of global illicit flows.²³

Residual method

14. The Residual method was first introduced in the World Development Report in 1985.²⁴ It tries to measure capital flight by looking at the difference between inflows (sources) of funds and outflows (uses) of funds, which are unrecorded.²⁵ The method measures capital flight as the sum of gross capital inflows and current account deficit, less increases in official foreign reserves. Capital inflows are defined as the sum of changes in gross foreign debt (public and private) and net foreign direct investment. This model may overestimate illegal outflows because of unrecorded government external debts that come from legitimate sources.²⁶ Also, there are questions about how well the residuals reflect capital flight and to what extent capital flight, which includes money laundering and tax evasion, actually measures money laundering.²⁷

Dooley method

15. The Dooley method assumes that the stock of claims held by non-residents, specifically privately held foreign assets that do not generate investment income reported in a country's balance of payments, can be taken as a measure of illicit capital

https://securereservercdn.net/45.40.149.159/34n.8bd.myftpupload.com/wp-content/uploads/2014/05/IFFs_from_Developing_Countries_Report-Full-Economist-Final.pdf?time=1576152230 at p. 5.

²³ D. Kar and D. Cartwright-Smith, *Illicit Financial Flows from Developing Countries: 2002 – 2006*, Global Financial Integrity, December 2008, available online at:

https://securereservercdn.net/45.40.149.159/34n.8bd.myftpupload.com/wp-content/uploads/2014/05/IFFs_from_Developing_Countries_Report-Full-Economist-Final.pdf?time=1576152230 at p. 5

²⁴ N. Hendriyetty and B.S. Grewal, "Macroeconomics of money laundering: effects and measurements", (2017) 24 *Journal of Financial Crime* 66 at p. 72.

²⁵ United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 16, available online at: https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf.

²⁶ N. Hendriyetty and B.S. Grewal, "Macroeconomics of money laundering: effects and measurements", (2017) 24 *Journal of Financial Crime* 66 at p. 72.

²⁷ United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 16, available online at: https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf.

flight.²⁸ It uses capital outflows within a country's balance of payments account and adjusts them to detect unrecorded capital outflows using errors and omissions and changes in external debt and international market interest rates.²⁹ The approach assumes that interest earned on legal and normal capital outflows will be reported in balances of payments, while interest earned on illegal capital will be unreported.

16. The Dooley method's applicability is limited by the fact that the data on short-term private sector capital flows required to generate the estimate are no longer available.³⁰ Other data limitations include problems with external debt data as reported by some heavily indebted poor countries and the lack of coverage and timeliness of balance of payments data on external borrowing.³¹ Also, there is a statistical problem in combining external debt stock data with flow data in the balance of payments. Moreover, the method may only reveal the inability of a country to attract foreign investment to compensate for external debt and may not explain the capital that has been transferred offshore with lower yields by individuals to avoid government control or a country's instability.³²

Trade Mispricing method

²⁸ N. Hendriyetty and B.S. Grewal, "Macroeconomics of money laundering: effects and measurements", (2017) 24 *Journal of Financial Crime* 66 at p. 73; D. Kar and D. Cartwright-Smith, *Illicit Financial Flows from Developing Countries: 2002 – 2006*, Global Financial Integrity, December 2008, available online at: <https://secureservercdn.net/45.40.149.159/34n.8bd.myftpupload.com/wp-content/uploads/2014/05/IFFs_from_Developing_Countries_Report-Full-Economist-Final.pdf?time=1576152230> at p. 6.

²⁹ N. Hendriyetty and B.S. Grewal, "Macroeconomics of money laundering: effects and measurements", (2017) 24 *Journal of Financial Crime* 66 at p. 73.

³⁰ D. Kar and D. Cartwright-Smith, *Illicit Financial Flows from Developing Countries: 2002 – 2006*, Global Financial Integrity, December 2008, available online at: <https://secureservercdn.net/45.40.149.159/34n.8bd.myftpupload.com/wp-content/uploads/2014/05/IFFs_from_Developing_Countries_Report-Full-Economist-Final.pdf?time=1576152230> at p. 6.

³¹ D. Kar and D. Cartwright-Smith, *Illicit Financial Flows from Developing Countries: 2002 – 2006*, Global Financial Integrity, December 2008, available online at: <https://secureservercdn.net/45.40.149.159/34n.8bd.myftpupload.com/wp-content/uploads/2014/05/IFFs_from_Developing_Countries_Report-Full-Economist-Final.pdf?time=1576152230> at pp. 6-7.

³² N. Hendriyetty and B.S. Grewal, "Macroeconomics of money laundering: effects and measurements", (2017) 24 *Journal of Financial Crime* 66 at p. 72.

17. The Trade Mispricing (or Misinvoicing) method estimates the extent of money laundering based on observations of abnormal prices. It measures under-invoicing/over-invoicing of exports/imports based on “unmatched” partner country international trade data.³³ It was first introduced as a way to measure the impact of tariffs on international trade in Turkey. If trade-based money laundering is an important component of money laundering, then this method may be appropriate in estimating international flows of illicit funds.³⁴ The underlying rationale is that residents can acquire foreign assets (and illegally transfer capital) by over-invoicing imports and under-invoicing exports.³⁵ Researchers using this model typically compare partner-country trade data and adjust for the cost of insurance and freight.³⁶ A developing country’s exports to the world are compared to what the world reports as having imported from that country and vice versa.

18. On the one hand, some argue international trade often provides an excellent conduit for illicit financial flows and therefore if trade mispricing is excluded from quantification efforts, estimates will seriously understate the outflows of illicit capital.³⁷

³³ B. Unger, “Money Laundering – A Newly Emerging Topic on the International Agenda”, (2009) 5 Review of Law & Economics 807 at pp. 812-814; N. Hendriyetty and B.S. Grewal, “Macroeconomics of money laundering: effects and measurements”, (2017) 24 Journal of Financial Crime 66 at p. 73; D. Kar and D. Cartwright-Smith, *Illicit Financial Flows from Developing Countries: 2002 – 2006*, Global Financial Integrity, December 2008, available online at:

<https://secureservercdn.net/45.40.149.159/34n.8bd.myftpupload.com/wp-content/uploads/2014/05/IFFs_from_Developing_Countries_Report-Full-Economist-Final.pdf?time=1576152230> at pp. 8-9. See also e.g. J. Zdanowicz, “Trade-Based Money Laundering and Terrorist Financing”, (2009) 5 Review of Law and Economics 855.

³⁴ N. Hendriyetty and B.S. Grewal, “Macroeconomics of money laundering: effects and measurements”, (2017) 24 Journal of Financial Crime 66 at p. 73.

³⁵ D. Kar and D. Cartwright-Smith, *Illicit Financial Flows from Developing Countries: 2002 – 2006*, Global Financial Integrity, December 2008, available online at:

<https://secureservercdn.net/45.40.149.159/34n.8bd.myftpupload.com/wp-content/uploads/2014/05/IFFs_from_Developing_Countries_Report-Full-Economist-Final.pdf?time=1576152230> at p. 8.

³⁶ D. Kar and D. Cartwright-Smith, *Illicit Financial Flows from Developing Countries: 2002 – 2006*, Global Financial Integrity, December 2008, available online at: <

https://secureservercdn.net/45.40.149.159/34n.8bd.myftpupload.com/wp-content/uploads/2014/05/IFFs_from_Developing_Countries_Report-Full-Economist-Final.pdf?time=1576152230> at p. 8.

³⁷ D. Kar and D. Cartwright-Smith, *Illicit Financial Flows from Developing Countries: 2002 – 2006*, Global Financial Integrity, December 2008, available online at:

<https://secureservercdn.net/45.40.149.159/34n.8bd.myftpupload.com/wp-content/uploads/2014/05/IFFs_from_Developing_Countries_Report-Full-Economist-Final.pdf?time=1576152230> at p. 9.

On the other hand, some researchers do not use the Trade Mispricing method because of a concern that trade mispricing behaves quite differently from other components of illicit outflows.³⁸ For instance, mis-invoicing often takes place in response to high trade taxes and thus may be unrelated to illicit flows captured by other models.

19. In addition, regular underreporting of trade statistics can occur in both directions in order to evade trade barriers and this can overwhelm capital flight through mis-invoicing. Other shortcomings with this approach are that not all mis-invoiced trade results in a difference between export and import values and trade transactions concluded by word-of-mouth or using channels such as informal financial institutions are not represented.³⁹ Further, estimates of illicit financial flows via the Trade Mispricing model do not include the proceeds of criminal commercial smuggling such as drugs, minerals and contraband goods and trade mispricing will not be picked up in the model if there is collusion between importers and exporters to fake invoices.⁴⁰

Global Financial Integrity method

20. Global Financial Integrity (“**GFI**”) is a Washington, D.C. organisation that works to curtail illicit financial flows through research, policy solutions and advice to governments.⁴¹ It uses a combination of the Trade Mispricing method and either the Residual or Hot Money method to estimate money laundering.⁴² In 2008, a GFI report used the Trade Mispricing and Residual methods to estimate illicit financial flows from

³⁸ D. Kar and D. Cartwright-Smith, *Illicit Financial Flows from Developing Countries: 2002 – 2006*, Global Financial Integrity, December 2008, available online at:

<https://secureservercdn.net/45.40.149.159/34n.8bd.myftpupload.com/wp-content/uploads/2014/05/IFFs_from_Developing_Countries_Report-Full-Economist-Final.pdf?time=1576152230> at p. 8.

³⁹ D. Kar and D. Cartwright-Smith, *Illicit Financial Flows from Developing Countries: 2002 – 2006*, Global Financial Integrity, December 2008, available online at:

<https://secureservercdn.net/45.40.149.159/34n.8bd.myftpupload.com/wp-content/uploads/2014/05/IFFs_from_Developing_Countries_Report-Full-Economist-Final.pdf?time=1576152230> at pp. 9-11.

⁴⁰ United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 16, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

⁴¹ Global Financial Integrity, About Us, available online at: <<https://gfintegrity.org/>>.

⁴² N. Hendriyetty and B.S. Grewal, “Macroeconomics of money laundering: effects and measurements”, (2017) 24 *Journal of Financial Crime* 66 at p. 73.

developing countries for 2002 to 2006.⁴³ In 2014, a GFI report used the Trade Mispricing and Hot Money methods to estimate illicit financial flows from developing countries for 2003 to 2013.⁴⁴

G. Extrapolations from estimates of the shadow or underground economy

21. Using the shadow or underground economy as a proxy for money laundering is a top down, macroeconomic approach. The terms “shadow economy” and “underground economy” are sometimes used interchangeably,⁴⁵ but some researchers differentiate between the two terms, with the shadow economy encompassing informal legal and criminal economic activity and the underground economy restricted to just criminal activity.⁴⁶

22. An overarching concern with any quantification of money laundering based on the size of the shadow or underground economy is that not all activities may constitute money laundering and so the estimate will likely overestimate the actual volume of money laundered.⁴⁷ Furthermore, shadow / underground economy approaches apply proxy variables without independent reliability testing.⁴⁸

⁴³ D. Kar and D. Cartwright-Smith, *Illicit Financial Flows from Developing Countries: 2002 – 2006*, Global Financial Integrity, December 2008, available online at: https://secureservercdn.net/45.40.149.159/34n.8bd.myftpupload.com/wp-content/uploads/2014/05/IFFs_from_Developing_Countries_Report-Full-Economist-Final.pdf?time=1576152230.

⁴⁴ D. Dar and J. Spanjers, *Illicit Financial Flows from Developing Countries: 2003-2012*, Global Financial Integrity, December 2014, available online at: <https://secureservercdn.net/45.40.149.159/34n.8bd.myftpupload.com/wp-content/uploads/2014/12/Illicit-Financial-Flows-from-Developing-Countries-2003-2012.pdf?time=1576152230>.

⁴⁵ See e.g. P. Reuter and E. Truman, *Chasing Dirty Money: The Fight Against Money Laundering*, Institute for International Economics, Washington, D.C., 2004, available online at: <https://books.google.ca/books?id=0AVwjC9TDSMC&printsec=frontcover&dq=chasing+dirty+money+google&hl=en&sa=X&ved=0ahUKEwjN1eKcncDmAhWTqZ4KHTAZC34Q6AEIKTAA#v=onepage&q=chasing%20dirty%20money%20google&f=false>.

⁴⁶ F. Schneider, “Money Laundering and Financial Means of Organized Crimes: Some Preliminary Empirical Findings”, “Paolo Baffi” Centre on Central Banking and Financial Regulation, Research Paper Series No. 2008-1 at pp. 9-10; P.C. Van Duyne, J.H. Harvey, L.Y. Gelemerova, *The Critical Handbook of Money Laundering: Policy, Analysis and Myths* (London, Palgrave Macmillan, 2018) at p. 204; FinTRAC, “Estimating the Scale of Money Laundering in Canada”, 2015 (redacted) at p. 11.

⁴⁷ FinTRAC, “Estimating the Scale of Money Laundering in Canada”, 2015 (redacted) at pp. 4-5 and 11.

⁴⁸ P.C. Van Duyne, J.H. Harvey, L.Y. Gelemerova, *The Critical Handbook of Money Laundering: Policy, Analysis and Myths* (London, Palgrave Macmillan, 2018) at p. 204.

Currency Demand method

23. In 1997, Vito Tanzi, then with the IMF, used the difference between money supply and money circulating in the United States' economy to estimate money laundering.⁴⁹ He also used it to estimate the extent of the shadow economy, which he defined as including licit as well as illicit funds. Tanzi compared the amount of money printed with the amount circulating. The Currency Demand approach assumes that cash is frequently used in hidden transactions to avoid observable traces for the authorities.⁵⁰
24. A benefit of this method is that an estimate is relatively easy to get if the data are available.⁵¹
25. Similarly, Ardizzi et al. tried to quantify the level of money laundering in Italy by estimating the role of criminal syndicates on in-payments across the country from 2005 to 2008.⁵² This variation of the Currency Demand approach used a statistical method

⁴⁹ J. Walker and B. Unger, "Measuring Global Money Laundering: 'The Walker Gravity Model' (2009) 5 Review of Law and Economics 821 at p. 828; FinTRAC, "Estimating the Scale of Money Laundering in Canada", 2015 (redacted) at p. 15; United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 16, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>; The World Bank, *Ill-gotten Money and the Economy: Experiences from Malawi and Namibia*, The World Bank, Washington, D.C., 2011 at p. 16; A. Chong and F. Lopez-de-Silanes, "Money Laundering and Its Regulation", (2015) 27 Economic & Politics 78 at pp. 97 and 100-102.

⁵⁰ FinTRAC, "Estimating the Scale of Money Laundering in Canada", 2015 (redacted) at p. 15; United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 16, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

⁵¹ FinTRAC, "Estimating the Scale of Money Laundering in Canada", 2015 (redacted) at p. 15.

⁵² FinTRAC, "Estimating the Scale of Money Laundering in Canada", 2015 (redacted) at pp. 14-15, citing G. Ardizzi, C. Petraglia, M. Piacenza, F. Schneider and G. Turati, "Estimating Money Laundering through a "Cash Deposit Demand" Approach", *Economia Informale, Evasione Fiscale E Corruzione*, Pavia, Aule Storiche dell'Università, September 24-25, 2012, available online at: <https://pdfs.semanticscholar.org/d8bf/a2784f44c54f8be1f61186d52f998f5aefd0.pdf?_ga=2.8657404.8333515.1576711134-1857495873.1576540280>Ar; P.C. Van Duyne, J.H. Harvey, L.Y. Gelemerova, *The Critical Handbook of Money Laundering: Policy, Analysis and Myths* (London, Palgrave Macmillan, 2018) at pp. 209-210, citing G. Ardizzi, C. Petraglia, M. Piacenza, F. Schneider and G. Turati, "Money

called the “Ordinary Least Squares Method”, to take a number of independent variables and assign coefficients to them to get an estimate of the value of cash deposits. The volume of money laundering was estimated from the excess demand for cash deposits unexplained by structural factors and shadow economy activities. Van Duyne et al. note Ardizzi et al.’s use of observed data was an improvement from earlier approaches that were merely theoretical models built from *a priori* assumptions to generate data.⁵³

26. There are several criticisms of the Currency Demand approach. It does not take into account use of the regular financial system or trade to transfer illicit funds even though today cash may no longer be a major way of holding illegal money.⁵⁴ The method also often makes no distinction between the shadow economy and money laundering.⁵⁵ Further, the method includes any legitimate currency held abroad, which can skew the results and excludes other factors that may explain unaccounted cash such as hoarding because of a fear of currency devaluation.⁵⁶ It does not account for money being laundered in multiple / foreign currencies or within a currency zone.⁵⁷

Laundering as a Crime in the Financial Sector: A New Approach to Quantitative Assessment, with an Application to Italy”, (2014) 46 Journal of Money, Credit and Banking 1555; W.A. Khan, S.T. Jawaid and I. Arif, “Where does a nation’s wealth go? Evidence from a third world country”, (2018) 21 Journal of Money Laundering Control 426 at p. 433, citing G. Ardizzi, C. Petraglia, M. Piacenza, F. Schneider and G. Turati, “Money Laundering as a Crime in the Financial Sector: A New Approach to Quantitative Assessment, with an Application to Italy”, (2014) 46 Journal of Money, Credit and Banking 1555.

⁵³ P.C. Van Duyne, J.H. Harvey, L.Y. Gelemerova, *The Critical Handbook of Money Laundering: Policy, Analysis and Myths* (London, Palgrave Macmillan, 2018) at p. 210.

⁵⁴ W.A. Khan, S.T. Jawaid and I. Arif, “Where does a nation’s wealth go? Evidence from a third world country”, (2018) 21 Journal of Money Laundering Control 426 at p. 434; J. Walker and B. Unger, “Measuring Global Money Laundering: ‘The Walker Gravity Model’”, (2009) 5 Review of Law and Economics 821 at p. 828.

⁵⁵ FinTRAC, “Estimating the Scale of Money Laundering in Canada”, 2015 (redacted) at p. 15; B. Unger, “Money Laundering – A Newly Emerging Topic on the International Agenda”, (2009) 5 Review of Law & Economics 807 at p. 810; United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 16m available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

⁵⁶ FinTRAC, “Estimating the Scale of Money Laundering in Canada”, 2015 (redacted) at p. 15; United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 16, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

⁵⁷ FinTRAC, “Estimating the Scale of Money Laundering in Canada”, 2015 (redacted) at p. 15; B. Unger, “Money Laundering – A Newly Emerging Topic on the International Agenda”, (2009) 5 Review of Law & Economics 807 at p. 810; United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 16, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>. For a more technical critique of Tanzi’s model to

Discrepancy between indicators of overall economic activity and official GDP

27. This is the same method as the Currency Demand method, but instead of cash discrepancies, it measures the size of the shadow economy by the discrepancy between an indicator of overall economic activity like electrical consumption and official gross domestic product (“**GDP**”).⁵⁸

28. The criticisms of the Currency Demand approach described above also apply to this method.⁵⁹

Dynamic / Multiple-Indicators Multiple-Causes model

29. A structural equation model called the “Dynamic Multiple-Indicators Multiple-Causes” (“**DYMIMIC**” or “**MIMIC**”) model, originally used to estimate the shadow economy, has been used to estimate money laundering.⁶⁰

30. The DYMIMIC model uses two sets of observable variables as proxy variables and links these to unobserved (i.e. “latent”) variables such as money laundering.⁶¹ One

estimate the shadow economy, see Chapter 1 of I. Deleanu, *Anti-money laundering efforts – failures, fixes and the future*, Ph.D. thesis, University of Utrecht, September 2015.

⁵⁸ A. Chong and F. Lopez-de-Silanes, “Money Laundering and Its Regulation”, (2015) 27 *Economic & Politics* 78 at p. 101; P.C. Van Duyne, J.H. Harvey, L.Y. Gelemerova, *The Critical Handbook of Money Laundering: Policy, Analysis and Myths* (London, Palgrave Macmillan, 2018) at p. 204.

⁵⁹ P.C. Van Duyne, J.H. Harvey, L.Y. Gelemerova, *The Critical Handbook of Money Laundering: Policy, Analysis and Myths* (London, Palgrave Macmillan, 2018) at pp. 204 and 207.

⁶⁰ F. Schneider, “Money Laundering and Financial Means of Organized Crimes: Some Preliminary Empirical Findings”, “Paolo Baffi” Centre on Central Banking and Financial Regulation, Research Paper Series No. 2008-1. See also J. Walker and B. Unger, “Measuring Global Money Laundering: ‘The Walker Gravity Model’”, (2009) 5 *Review of Law and Economics* 821 at p. 829.

⁶¹ F. Schneider, “Money Laundering and Financial Means of Organized Crimes: Some Preliminary Empirical Findings”, “Paolo Baffi” Centre on Central Banking and Financial Regulation, Research Paper Series No. 2008-1 at pp. 21-22. See also: F. Schneider and U. Windischbauer, “Money laundering: some facts”, (2008) 26 *European Journal of Law and Economics* 387; F. Schneider, “Turnover of organized crime and money laundering: some preliminary empirical findings”, (2010) 144 *Public Choice* 47; F. Schneider, “The Financial Proceeds of Transnational Organized Crime All Over the World: Some New Empirical Facts”, (2013) 33 *SAIS Review of International Affairs* 91; A. Buehn and F. Schneider, “A

set of the observable variables is made up of cause variables (various criminal activities).⁶² The second set of observable variables is made up of indicator variables (e.g. confiscated money, prosecuted persons, increases in crime rates).⁶³

31. The explanatory observable variables are combined in multiple regression models where the explanatory variable in one equation can be used as a dependent variable in another.⁶⁴ This approach allows construction of a picture of the causal relationships among all variables used (captured in covariance matrices). From this it is possible to build, first, a structural model showing all potential causal dependencies between dependent and independent variables, and then build a measurement model that describes the relationship between the unobserved variable and its indicators. Applying principles of parsimony and statistical techniques, the aim is to arrive at the smallest set of observable variables that can be used to best measure the unobserved variable (money laundering).

32. There are several advantages of the DYMIMIC model. The model can apply to all countries and all jurisdictions.⁶⁵ It can use a number of different indicator and causal variables and it is quite flexible because one can vary the choice of causal and indicator

preliminary attempt to estimate the financial flows of transnational crime using the MIMIC method”, in *Research Handbook on Money Laundering*, B. Unger and D. van der Linde, eds. (Cheltenham, UK: Edward Elgar, 2013) at pp. 172-189.

⁶² J. Walker and B. Unger, “Measuring Global Money Laundering: ‘The Walker Gravity Model’”, (2009) 5 *Review of Law and Economics* 821 at p. 829.

⁶³ J. Walker and B. Unger, “Measuring Global Money Laundering: ‘The Walker Gravity Model’”, (2009) 5 *Review of Law and Economics* 821 at p. 829.

⁶⁴ F. Schneider, “Money Laundering and Financial Means of Organized Crimes: Some Preliminary Empirical Findings”, “Paolo Baffi” Centre on Central Banking and Financial Regulation, Research Paper Series No. 2008-1; F. Schneider and U. Windischbauer, “Money laundering: some facts”, (2008) 26 *European Journal of Law and Economics* 387; . Schneider, “Turnover of organized crime and money laundering: some preliminary empirical findings”, (2010) 144 *Public Choice* 47; F. Schneider, “The Financial Proceeds of Transnational Organized Crime All Over the World: Some New Empirical Facts”, (2013) 33 *SAIS Review of International Affairs* 91; A. Buehn and F. Schneider, “A preliminary attempt to estimate the financial flows of transnational crime using the MIMIC method”, in *Research Handbook on Money Laundering*, B. Unger and D. van der Linde, eds. (Cheltenham, UK: Edward Elgar, 2013) at pp. 172-189.

⁶⁵ United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 17, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>; N. Hendriyetty and B.S. Grewal, “Macroeconomics of money laundering: effects and measurements”, (2017) 24 *Journal of Financial Crime* 66 at p. 74.

variables according to particular features of the informal economic activity studied, the period in question and the availability of data.⁶⁶ Also, well known and generally optimal (if the sample is sufficiently large) statistical testing procedures can be applied.

33. However, as with all money laundering quantification methods, there are problems with the DYMIMIC model.

34. In 2008, Friedrich Schneider estimated the amount of money laundering or profits from criminal activities for 20 OECD countries for 1994/95, 1997/98, 2000/2001, 2002/2003, 2003/04 and 2004/05.⁶⁷ To calculate the absolute values of the size of the shadow economies from the DYMIMIC estimation results, Schneider used already available estimates of aggregated figures, which were estimates of money laundering from other sources such as the IMF 1998 estimate (see above) and the Walker Gravity model (see below).⁶⁸ Therefore, his relative estimated value of the size and development of money laundering was based on the absolute values of other estimations.⁶⁹ Schneider acknowledged this was a big difficulty in using his method.

35. Another problem with the DYMIMIC approach is that the choice of cause and indicator variables is arbitrary and not theoretically-based.⁷⁰ Also, because the model

⁶⁶ A. Buehn and F. Schneider, "A preliminary attempt to estimate the financial flows of transnational crime using the MIMIC method", in *Research Handbook on Money Laundering*, B. Unger and D. van der Linde, eds. (Cheltenham, UK: Edward Elgar, 2013) at p. 180.

⁶⁷ F. Schneider, "Money Laundering and Financial Means of Organized Crimes: Some Preliminary Empirical Findings", "Paolo Baffi" Centre on Central Banking and Financial Regulation, Research Paper Series No. 2008-1.

⁶⁸ F. Schneider, "Money Laundering and Financial Means of Organized Crimes: Some Preliminary Empirical Findings", "Paolo Baffi" Centre on Central Banking and Financial Regulation, Research Paper Series No. 2008-1 at p. 23; F. Schneider, "The Financial Proceeds of Transnational Organized Crime All Over the World: Some New Empirical Facts", (2013) 33 SAIS Review of International Affairs 91 at pp. 92-99.

⁶⁹ F. Schneider, "Money Laundering and Financial Means of Organized Crimes: Some Preliminary Empirical Findings", "Paolo Baffi" Centre on Central Banking and Financial Regulation, Research Paper Series No. 2008-1 at pp. 21-22; A. Buehn and F. Schneider, "A preliminary attempt to estimate the financial flows of transnational crime using the MIMIC method", in *Research Handbook on Money Laundering*, B. Unger and D. van der Linde, eds. (Cheltenham, UK: Edward Elgar, 2013) at pp. 180-181.

⁷⁰ J. Walker and B. Unger, "Measuring Global Money Laundering: 'The Walker Gravity Model'", (2009) 5 Review of Law and Economics 821 at p. 829; United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report,

uses factor analysis to determine how well the different cause variables explain the unobservable variable (money laundering) and does the same for the indicator variables, this means statistics, and not expert opinion, decide which indicators form the relevant bundle of causes of money laundering.⁷¹ The estimation procedure is also very sensitive to changes in variables.⁷²

36. Finally, the approach is confirmatory rather than exploratory.⁷³ This means the DYMIMIC method is more likely to determine whether a certain model is valid than to find a suitable model.

Two Sector / General Equilibrium model

37. The Two Sector / General Equilibrium model is a top down way to measure money laundering.⁷⁴ The method uses economic theory to estimate the value of the underground economy, which then acts as a measure of money laundering. The model assumes the extent of money laundering may be derived from a well-behaved theoretical model, which was previously used to measure the underground economy.⁷⁵ Behaviour is predicted from theory by deriving an equilibrium equation from observable

October 2011 at p. 17, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

⁷¹ J. Walker and B. Unger, "Measuring Global Money Laundering: 'The Walker Gravity Model'", (2009) 5 *Review of Law and Economics* 821 at p. 829; United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 17, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

⁷² N. Hendriyetty and B.S. Grewal, "Macroeconomics of money laundering: effects and measurements", (2017) 24 *Journal of Financial Crime* 66 at p. 74.

⁷³ A. Buehn and F. Schneider, "A preliminary attempt to estimate the financial flows of transnational crime using the MIMIC method", in *Research Handbook on Money Laundering*, B. Unger and D. van der Linde, eds. (Cheltenham, UK: Edward Elgar, 2013) at p. 180.

⁷⁴ A. Argentiero, M. Bagella and F. Busato, "Money laundering in a two-sector model: using theory for measurement", (2008) 26 *Eur J Law Econ* 341. See also M. Bagella, F. Busato and A. Argentiero, "Using dynamic macroeconomics for estimating money laundering: a simulation for the EU, Italy and the United States", in *Research Handbook on Money Laundering*, B. Unger and D. van der Linde, eds. (Cheltenham, UK, 2013) at pp. 207-223, which applies the model to Italy, the European Union 15 and the United States.

⁷⁵ A. Argentiero, M. Bagella and F. Busato, "Money laundering in a two-sector model: using theory for measurement", (2008) 26 *Eur J Law Econ* 341 at p. 344.

and estimated data to generate the unobservable variable of the size of the illegal economy.⁷⁶

38. The model forecasts the development of two sectors, regular and criminal, each with two agents, firms and households. There are two classes of firms, one producing a regular good (i.e. a commodity) and one producing an irregular good, which generates money to be laundered. There are also two classes of households that consume these goods and can supply labour services to the: (1) regular sector, subject to transaction costs proportional to the good (hours spent transacting); and (2) criminal sector, subject to costs represented by the risk of violating the law and the possible consequences of imprisonment. If households want more liquid funds, they must engage in the illegal sector. The “optimal” money laundered depends on the amount of labour allocated to the legal and illegal sector and on the prices and quantities of both goods.

39. An important advantage of this method is it produces data for unobservable components at a high frequency (quarterly) and over a longer sample, which creates a sufficient number of observations for a time-series econometric analysis with the simulated data.⁷⁷ The method can be applied to any country.⁷⁸ Another benefit is the model’s ability to compare its forecasts of the development of the legal sector to real GDP data to determine the accuracy of the model and infer the reliability of the illegal sector estimate.⁷⁹ Thus, one overarching disadvantage of most methodologies used to estimate the volume of money laundering, the inherent difficulty of verifying the accuracy and reliability of results, is addressed.

⁷⁶ A. Argentiero, M. Bagella and F. Busato, “Money laundering in a two-sector model: using theory for measurement”, (2008) 26 Eur J Law Econ 341 at p. 349.

⁷⁷ A. Argentiero, M. Bagella and F. Busato, “Money laundering in a two-sector model: using theory for measurement”, (2008) 26 Eur J Law Econ 341 at p. 344.

⁷⁸ A. Argentiero, M. Bagella and F. Busato, “Money laundering in a two-sector model: using theory for measurement”, (2008) 26 Eur J Law Econ 341 at p. 345.

⁷⁹ FinTRAC, “Estimating the Scale of Money Laundering in Canada”, 2015 (redacted) at pp. 4-5; N. Hendriyetty and B.S. Grewal, “Macroeconomics of money laundering: effects and measurements”, (2017) 24 Journal of Financial Crime 66 at p. 74; United Nations Office on Drugs and Crime, Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes, Research Report, October 2011 at p. 18, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

40. Moreover, unlike the Walker Gravity model (described below), this approach has the advantage of a solid microeconomic foundation, which helps identify rational laundering behavior.⁸⁰

41. In terms of disadvantages, FinTRAC concluded that while the use of macroeconomic data makes the model less subjective, it also means it relies on a variety of assumptions (i.e. all else held constant condition; economy is divided into legal and illegal economies; model captures all costs associated with working in the illegal and legal sectors; individual decision makers are rational).⁸¹ Similarly, van Duyne et al. 2018 opined that much of the theoretical reasoning underpinning equilibrium models requires such simplification and abstraction that the models are removed from reality.⁸² Furthermore, the approach does not use observed data to measure money laundering; it focuses exclusively on data generated by the calibration of theoretical models.⁸³

H. Extrapolations from suspicious transaction reports or other indicators of potential money laundering

42. Estimating money laundering via extrapolations from suspicious transaction reports (“**STRs**”) is a bottom up approach. STRs or other suspicious transaction indicators only provide an estimate of money laundering in a specific sector in which the STRs or other indicators are produced.

43. An early example of this method is Michael Gold and Michael Levi’s 1994 work analysing financial data, including STRs, to identify the extent of money laundering in

⁸⁰ B. Unger, “Money Laundering – A Newly Emerging Topic on the International Agenda”, (2009) 5 Review of Law & Economics 807 at pp. 814-845.

⁸¹ FinTRAC, “Estimating the Scale of Money Laundering in Canada”, 2015 (redacted) at pp. 4-5.

⁸² P.C. Van Duyne, J.H. Harvey, L.Y. Gelemerova, The Critical Handbook of Money Laundering: Policy, Analysis and Myths (London, Palgrave Macmillan, 2018) at p. 210.

⁸³ N. Hendriyetty and B.S. Grewal, “Macroeconomics of money laundering: effects and measurements”, (2017) 24 Journal of Financial Crime 66 at p. 74.

the United Kingdom.⁸⁴ Gold and Levi reviewed a sample of 1,000 FINLOGs from the United Kingdom's National Criminal Intelligence Service ("NCIS").⁸⁵ A FINLOG is created when a financial institution makes a disclosure of possible money laundering to the Economic Crime Branch of the NCIS (staffed by police and customs officers).⁸⁶ The NCIS duty officers make an initial decision about whether investigation is allocated to police or Customs.

44. Gold and Levi did not actually attempt to quantify the amount of money laundering. Rather, they reviewed the data and interviewed NCIS and other enforcement personnel to get a composite picture of the nature and impact of STRs.⁸⁷

45. In 2009, John Zdanowicz analysed monthly data contained in the United States Merchandise Trade Data Base and identified suspicious merchandise flows, the share of trade subject to money-laundering for each country and the amount of money-laundering between the United States and countries on the Al-Qaida watch list.⁸⁸ The method compared the country average price of an exported product with the world average price for the same (as far as possible) product using standardised commodity codes employed by all countries. All transactions with a price below the 5% margin or

⁸⁴ FinTRAC, "Estimating the Scale of Money Laundering in Canada", 2015 (redacted) at p. 6, citing M. Gold and M. Levi, *Money Laundering in the United Kingdom: An Appraisal of Suspicious-Base Reporting* (London: Police Foundation, 1994). See also J. Walker and B. Unger, "Measuring Global Money Laundering: 'The Walker Gravity Model'", (2009) 5 *Review of Law and Economics* 821 at p. 827; P.C. Van Duyne, J.H. Harvey, L.Y. Gelemerova, *The Critical Handbook of Money Laundering: Policy, Analysis and Myths* (London, Palgrave Macmillan, 2018) at p. 219; The World Bank, *Ill-gotten Money and the Economy: Experiences from Malawi and Namibia*, The World Bank, Washington, D.C., 2011 at p. 17, all citing M. Levi and M. Gold, *Money Laundering in the United Kingdom: An Appraisal of Suspicious-Base Reporting* (London: Police Foundation, 1994).

⁸⁵ . Gold and M. Levi, *Money-Laundering in the UK: An Appraisal of Suspicion-based Reporting* (London: The Police Foundation / University of Wales, 1994) at pp. 57-59.

⁸⁶ M. Gold and M. Levi, *Money-Laundering in the UK: An Appraisal of Suspicion-based Reporting* (London: The Police Foundation / University of Wales, 1994) at p. 28.

⁸⁷ M. Gold and M. Levi, *Money-Laundering in the UK: An Appraisal of Suspicion-based Reporting* (London: The Police Foundation / University of Wales, 1994) at p. 57.

⁸⁸ J. Ferwerda, M. Kattenberg, H.-H. Chang, B. Unger, L. Groot and J.A. Bikker, "Gravity models of trade-based money laundering" (2013) 45 *Applied Economics* 3170 at p. 3173, citing J. Zdanowicz, "Trade-Based Money Laundering and Terrorist Financing", (2009) 5 *Review of Law and Economics* 855; United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at pp. 17-18, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>, also citing work by Professor Zdanowicz.

above the 95% margin around the “usual” prices were classified as trade-based money laundering attempts. Zdanowicz used country prices, world prices and variance measures to determine unusual transactions. A similar approach was adopted by Eurostat (2010) as part of the European Union action plan to develop a coherent strategy to measure crime.⁸⁹

46. Zdanowicz’s method assumes product prices are normally distributed and that unusual prices have a criminal intention and are not just booking errors by customs officials.⁹⁰ Another weakness of this model is that no matter how great the price fluctuations are, the model classifies 10% of all transactions as always suspicious (the upper and lower 5%).⁹¹ While the pricing within these bounds might arise from laundering, it also could arise from capital flight, capital controls or evasion of trade duties.⁹²

47. There are also more general problems with using STRs to estimate money laundering. The STR method is both over- and under-inclusive because it can capture suspicious transactions that are actually legitimate and can exclude legitimate transactions that are actually criminal.⁹³ Also, STRs are subject to multiple interpretations⁹⁴ and they may only provide the number of total transactions and not the value of those transactions.⁹⁵ Moreover, because the same money may go through

⁸⁹ The World Bank, *Ill-gotten Money and the Economy: Experiences from Malawi and Namibia*, The World Bank, Washington, D.C., 2011 at p. 17.

⁹⁰ United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 18, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

⁹¹ United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 18, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

⁹² P.C. Van Duyne, J.H. Harvey, L.Y. Gelemerova, *The Critical Handbook of Money Laundering: Policy, Analysis and Myths* (London, Palgrave Macmillan, 2018) at p. 217.

⁹³ P.C. Van Duyne, J.H. Harvey, L.Y. Gelemerova, *The Critical Handbook of Money Laundering: Policy, Analysis and Myths* (London, Palgrave Macmillan, 2018) at p. 219; J. Walker and B. Unger, “Measuring Global Money Laundering: ‘The Walker Gravity Model’”, (2009) 5 *Review of Law and Economics* 821 at p. 827.

⁹⁴ M. Levi, P. Reuter and T. Halliday, “Can the AML System be evaluated without better data?”, (2018) 69 *Crime Law Social Change* 307 at p. 319.

⁹⁵ M. Levi, P. Reuter and T. Halliday, “Can the AML System be evaluated without better data?”, (2018) 69 *Crime Law Social Change* 307 at p. 319.

many different transactions in the laundering process, using financial transaction data is certain to involve double or even more counting.⁹⁶

48. Based on a literature survey, FinTRAC concluded the STR approach was not rigorous enough to be a standalone method to estimate money laundering, but the volume of transactions in STRs or case disclosures could give a broad order of magnitude of higher risk flows transiting through a financial system.⁹⁷

I. Extrapolations from proceeds of crime data

49. Using data on the proceeds of crime to estimate the scale of money laundering is a bottom-up approach. Extrapolations from proceeds of crime data all start with case studies, which can give minimum estimates of money laundering. Some researchers use case studies in conjunction with econometric modelling to quantify money laundering. This latter work is based on an international trade flow model called, the gravity model.

50. Using data on proceeds of crime to estimate money laundering has three overarching problems: (1) it is not known how representative police data on proceeds of crime are in relation to total money laundering; (2) it is contingent on access to solid quantitative data, including data related to predicate offences; and (3) it is dependent on accurately estimating the percentage of proceeds being laundered for various types of crimes.⁹⁸

⁹⁶ J. Walker and B. Unger, "Measuring Global Money Laundering: 'The Walker Gravity Model'", (2009) 5 Review of Law and Economics 821 at p. 827; United Nations Office on Drugs and Crime, Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes, Research Report, October 2011 at p. 48, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

⁹⁷ FinTRAC, "Estimating the Scale of Money Laundering in Canada", 2015 (redacted) at p. 6.

⁹⁸ FinTRAC, "Estimating the Scale of Money Laundering in Canada", 2015 (redacted) at p. 2; M. Levi, P. Reuter and T. Halliday, "Can the AML System be evaluated without better data?", (2018) 69 Crime Law Social Change 307 at p. 318.

Case studies

51. In the 2000s, Stephen Schneider and Margaret Beare analysed Canadian police cases defined by the Royal Canadian Mounted Police (“RCMP”) as proceeds of crime cases to estimate money laundering in Canada.⁹⁹ Schneider also used this case study to estimate money laundering in the securities sector.¹⁰⁰ The objectives of the Schneider and Beare study were to identify, examine and quantify the types of illegal activity that generated the criminal revenue invested into the legitimate economy, the sectors of the economy into which criminal proceeds were placed, specific assets or services used within the respective sectors, transactions and processes used for money laundering purposes and specific guises and/or techniques used to facilitate money laundering at deposit institutions.¹⁰¹

52. The study had limitations on the reliability of data and the data’s ability to extrapolate research findings to the broader universe of money laundering in Canada.¹⁰² First, because money laundering by its nature is meant to conceal assets from law enforcement, there was no guarantee that the proceeds of crime case study was able to identify all of the assets and laundering vehicles associated with a particular criminal conspiracy. Second, the study’s exclusive reliance on police cases meant that examples of money laundering included in the study were skewed toward those identified and investigated by the RCMP Proceeds of Crime Sections and the Integrated Proceeds of Crime Units. In other words, the study was filtered through the enforcement priorities and capacities of police. Third, sampling revolved around the quality and completeness of the information in the RCMP Management Information System

⁹⁹ S. Schneider, *Money Laundering in Canada: An Analysis of RCMP Cases* (Toronto, York University, 2004); S. Schneider, “Money Laundering Through Securities: An Analysis of Canadian Police Cases”, (2004) 4 *Asper Review* 169; M. Beare and S. Schneider, *Money Laundering in Canada: Chasing Dirty and Dangerous Dollars* (Toronto: University of Toronto Press, 2007) at pp. 76-146.

¹⁰⁰ S. Schneider, “Money Laundering Through Securities: An Analysis of Canadian Police Cases”, (2004) 4 *Asper Review* 169.

¹⁰¹ S. Schneider, “Money Laundering Through Securities: An Analysis of Canadian Police Cases”, (2004) 4 *Asper Review* 169 at p. 172.

¹⁰² S. Schneider, “Money Laundering Through Securities: An Analysis of Canadian Police Cases”, (2004) 4 *Asper Review* 169 at pp. 175-176; M. Beare and S. Schneider, *Money Laundering in Canada: Chasing Dirty and Dangerous Dollars* (Toronto: University of Toronto Press, 2007) at p. 324, footnote 2.

database, which meant some information was missing or entered erroneously and so it was not possible to draw a random sample.

53. Meloen et al. 2003 analysed 52 criminal cases in the Netherlands where property was confiscated in relation to money laundering and estimated the amount of money laundering activities per case.¹⁰³ As with the Schneider and Beare work, it was unclear how representative these data were.¹⁰⁴

54. Reuter and Truman in 2004 estimated proceeds of crime, including tax evasion, in the United States for 1965 to 2000 and in 1990 only, based on crime statistics and information from drug use surveys.¹⁰⁵ The study indicated tax evasion accounted for more than half of the total illegal proceeds. Therefore, even if the numbers were taken at face value, they were only weakly related to money laundering.¹⁰⁶

55. Van Duyne 2006 looked at the relationship between money laundering and predicate crime in Serbia from 2000-2005 using three approaches: (1) identifying

¹⁰³ J. Walker and B. Unger, "Measuring Global Money Laundering: 'The Walker Gravity Model'", (2009) 5 Review of Law and Economics 821 at p. 827 and United Nations Office on Drugs and Crime, Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes, Research Report, October 2011 at p. 15, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>, citing J. Meloen, R. Landman, H. de Miranda, J. van Eekelen and S. van Soest, *Buit en besteding* (Gravenhage: Elsevier Overheid, 2003). (The Commission does not have this Dutch publication.)

¹⁰⁴ J. Walker and B. Unger, "Measuring Global Money Laundering: 'The Walker Gravity Model'", (2009) 5 Review of Law and Economics 821 at p. 827; United Nations Office on Drugs and Crime, Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes, Research Report, October 2011 at p. 15, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

¹⁰⁵ P. Reuter and E. Truman, *Chasing Dirty Money: The Fight Against Money Laundering*, Institute for International Economics, Washington, D.C., 2004, available online at: <<https://books.google.ca/books?id=0AVwjC9TDSMC&printsec=frontcover&dq=chasing+dirty+money+google&hl=en&sa=X&ved=0ahUKEwjN1eKcncDmAhWTqZ4KHTAZC34Q6AEIKTAA#v=onepage&q=chasing%20dirty%20money%20google&f=false>>. He used: United States Office of National Drug Policy (2000 and 2001); Simon and Witte (1982); United States General Accounting (1980); Federal Bureau of Investigation's annual Uniform Crime Reports; Internal Revenue Service data; International Organization on Migration data; and data reported in the literature.

¹⁰⁶ P. Reuter and E. Truman, *Chasing Dirty Money: The Fight Against Money Laundering*, Institute for International Economics, Washington, D.C., 2004 at p. 23, available online at: <<https://books.google.ca/books?id=0AVwjC9TDSMC&printsec=frontcover&dq=chasing+dirty+money+google&hl=en&sa=X&ved=0ahUKEwjN1eKcncDmAhWTqZ4KHTAZC34Q6AEIKTAA#v=onepage&q=chasing%20dirty%20money%20google&f=false>>.

relevant parameters and identifying discrepancies (e.g. between resources and expenses); (2) estimates of actual crime from reported and sanctioned crime; and (3) gathering perceptions through surveys.¹⁰⁷ The latter were used because of a lack of proper accounting records and crime recording in Serbia.¹⁰⁸ Professor van Duyne later said the data were biased because the population consisted of convicted offenders.¹⁰⁹

56. As part of its membership in the Financial Action Task Force, the Department of Finance issued a report on the *Assessment of Inherent Risks of Money Laundering and Terrorist Financing in Canada: 2015* to identify, assess and understand inherent money laundering and terrorist financing risks in Canada.¹¹⁰ During a series of workshops, experts from Canada's anti-money laundering and anti-terrorist financing regimes assessed the threats and inherent vulnerabilities of sectors and products using a low, medium, high or very high rating.¹¹¹

57. Workshop participants reviewed Canadian information and data for 21 criminal activities that were considered most associated with generating proceeds of crime in Canada and third-party money laundering. The money laundering threat was rated for each criminal activity against four rating criteria: the extent of the threat actors' knowledge, skills and expertise to conduct money laundering; the extent of the threat actors' network, resources and overall capability to conduct money laundering; the

¹⁰⁷ Organization for Security and Co-operation in Europe and United Nations Interregional Crime and Justice Research Institute, *A report on Money laundering and Predicate Crime in Serbia 2000-2005*, October 2006, available online at: http://www.unicri.it/topics/organized_crime_corruption/archive/money_laundering_serbia/MoneyLaunderingSerbia2000-2005.pdf

¹⁰⁸ The study also used extrapolations from suspicious transactions and currency demand. Suspicious transaction data by looking at household sector income and expenditure for evidence of the black economy. If the household spend was systematically beyond its means then there were reasons to speculate were the deficit came from in the event that it was not from savings. Balance of payments data from international trade was also reviewed.

¹⁰⁹ P. van Duyne, "(Transnational) Organised Crime, Laundering and the Congregation of the Gullible", Valedictory, Tilburg University, March 14, 2011 at p. 29, available online at: <http://www.petrusvandyne.nl/wp-content/uploads/2017/08/Afscheidsrede-Valedictory.pdf>.

¹¹⁰ Department of Finance Canada, *Assessment of Inherent Risks of Money Laundering and Terrorist Financing in Canada: 2015*, Government of Canada, July 2015, available online at: <https://fin.gc.ca/pub/mltf-rpcf/mtf-rpcf-eng.pdf> at p. 5.

¹¹¹ Department of Finance Canada, *Assessment of Inherent Risks of Money Laundering and Terrorist Financing in Canada: 2015*, Government of Canada, July 2015, available online at: <https://fin.gc.ca/pub/mltf-rpcf/mtf-rpcf-eng.pdf> at p. 16.

scope and complexity of the money laundering activity; and the magnitude of the proceeds of crime being generated annually from the criminal activity. While the value of the proceeds of crime generated annually from each of the 21 predicate crimes formed part of the threat level assessment, these numbers are not made public in the report.

58. In 2019, Melvin Soudijn, a research with the Dutch National Police, published a paper in which he used “Criminal Pattern Analysis” (“**CPA**”) to look at changes in money laundering by organised crime in the Netherlands from 2004 to 2016.¹¹² The CPA used information in police reports combined with interviews with money laundering or organised crime experts to determine methods used for laundering, to estimate the size of the illegal market and learn about characteristics of perpetrators, adverse impacts on society and future expectations. Soudijn noted that reliance on police data had limitations.¹¹³ The data was limited in that it was produced to serve a particular function (i.e. for prosecutorial purposes) and is incomplete as it is constrained by policing priorities. Mr. Soudijn said that studying police files was a useful means of obtaining qualitative information about certain criminal phenomena in the Netherlands, but explained that absolute figures per types of money laundering were not available.¹¹⁴ Overall, the article concluded that police reports can have useful information that could serve as starting points for further policy research.¹¹⁵

59. Case studies based on crime data provide a good indication of the extent of money laundering at the smaller end of the money laundering scale.¹¹⁶ They are also

¹¹² M.R.J. Soudijn, “Using Police Reports to Monitor Money Laundering Developments. Continuity and Change in 12 Years of Dutch Money Laundering Crime Pattern Analysis”, (2019) 25 Eur. J. Crim. Policy Res. 83.

¹¹³ M.R.J. Soudijn, “Using Police Reports to Monitor Money Laundering Developments. Continuity and Change in 12 Years of Dutch Money Laundering Crime Pattern Analysis”, (2019) 25 Eur. J. Crim. Policy Res. 83 at pp. 88-89.

¹¹⁴ M.R.J. Soudijn, “Using Police Reports to Monitor Money Laundering Developments. Continuity and Change in 12 Years of Dutch Money Laundering Crime Pattern Analysis”, (2019) 25 Eur. J. Crim. Policy Res. 83 at p. 89.

¹¹⁵ M.R.J. Soudijn, “Using Police Reports to Monitor Money Laundering Developments. Continuity and Change in 12 Years of Dutch Money Laundering Crime Pattern Analysis”, (2019) 25 Eur. J. Crim. Policy Res. 83 at p. 95.

¹¹⁶ B. Unger, “Money Laundering – A Newly Emerging Topic on the International Agenda”, (2009) 5 Review of Law & Economics 807 at p. 809.

very helpful in order to understand the behaviour of launderers, what they consume, where they launder, how they launder and so on.

60. However, like STRs, crime data are process statistics, which are subject to multiple interpretations.¹¹⁷ In order to be more than just descriptions of specific cases, researchers must make some assumptions about the underlying population of money launderers.¹¹⁸ Thus, interpretations based on case studies exclude the full range of money laundering practices, networks and behavioural assumptions.

61. Furthermore, prosecutions for money laundering are the consequence of investigative follow up and prosecution attitude, competence and resources. Police statistics may say more about the organizational qualities of the police than about crime and this means case studies are not a random sample.¹¹⁹ Also, the lack of qualitative insight into the nature and seriousness of prosecutions is a major issue with case studies as a way to quantify money laundering.¹²⁰ For example, to avoid criticism for low prosecution rates, some countries might choose to prosecute more low level laundering cases rather than prioritise a smaller number of prosecutions or other interventions against key enablers.

62. Finally, estimates of money laundering based on the study of police files have an intrinsic logic problem when aggregated: the stricter the fight against money laundering, the more eagerly police will record money laundering cases.¹²¹

¹¹⁷ M. Levi, P. Reuter and T. Halliday, "Can the AML System be evaluated without better data?", (2018) 69 *Crime Law Social Change* 307 at pp. 319-320.

¹¹⁸ B. Unger, "Money Laundering – A Newly Emerging Topic on the International Agenda", (2009) 5 *Review of Law & Economics* 807 at p. 809.

¹¹⁹ M. Beare and S. Schneider, *Money Laundering in Canada: Chasing Dirty and Dangerous Dollars* (Toronto: University of Toronto Press, 2007) at p. 76.

¹²⁰ M. Levi, P. Reuter and T. Halliday, "Can the AML System be evaluated without better data?", (2018) 69 *Crime Law Social Change* 307 at p. 320.

¹²¹ J. Walker and B. Unger, "Measuring Global Money Laundering: 'The Walker Gravity Model'", (2009) 5 *Review of Law and Economics* 821 at p. 827.

Walker Gravity model

63. John Walker first adapted the gravity model to estimate the volume of money laundering in Australia in the 1990s.¹²²

64. There are three key assumptions built into the Walker Gravity model about money laundering.¹²³ First, not all laundered money leaves the country. Second, countries where official corruption is common provide benign environments for launderers. Third, laundered money seeks countries with attractive banking regimes: (1) tax havens; (2) “no questions asked” banking; and (3) countries with stable economies and low risk.

65. While Walker’s original model has been somewhat modified (by him and others), the basic approach remains the same: (1) first, the quantity of money laundering in each country in the world is estimated; and (2) second, the quantity of illicit money flowing to each country is modeled.

66. The estimate of the quantity of money laundered in each country is dependent principally upon:

1. estimates of the nature and extent of crime in that country via proceeds of crime data;
2. an estimated amount of money laundered per reported crime, for each type of crime; and
3. the economic environment in which the crime and the laundering take place.¹²⁴

¹²² J. Walker, “How Big is Global Money Laundering?”, (1999) 3 *Journal of Money Laundering Control* 25.

¹²³ J. Walker and B. Unger, “Measuring global money laundering: the ‘Walker Gravity Model’” in *Research Handbook on Money Laundering*, B. Unger and D. van der Linde, eds. (Cheltenham, UK, 2013) at p. 164.

¹²⁴ J. Walker, “How Big is Global Money Laundering?”, (1999) 3 *Journal of Money Laundering Control* 25 at p. 27.

The modelling uses a formula adapted from an input-output model for measuring transnational trade flows and grounded in Newton's Law of Universal Gravitation.¹²⁵

67. Walker describes the model's as a seven-stage process as follows:

(1) As a starting point, the United Nations Centre for International Crime Prevention database of recorded crime statistics — the 'UN Survey on Crime Trends and the Operations of Criminal Justice Systems' — contains data on numbers of crimes recorded per year in almost 100 countries. These relate to the crime categories of homicide, assault, rape, robbery, bribery, embezzlement, fraud, burglary, theft, drug possession and drug trafficking.

(2) It is no secret that there are differences in the ways countries classify and count criminal incidents, and that there are significant differences in the extent that police get to know about crimes. But research has also shown how to read between the lines of official crime statistics, by using crime victims' surveys of the kind pioneered since 1988 by the Dutch Ministry of Justice and by the United Nation Interregional Crime Research Institute in Rome ("**UNICR**"). Enough is known to 'see through' major discrepancies in official crime statistics, and make the necessary adjustments...

(3) There are, in addition, a number of countries —mostly smaller, less developed countries — for which we have neither official crime statistics nor crime victims' surveys. They are mostly, by definition, not major players in the system. Some, however, are regarded as attractive to those seeking to launder money. No country, therefore, can be left out of the model. Using knowledge of the prevailing socio-economic circumstances of each of these countries, per capita crime rates from similar or neighbouring countries can be applied to their demographic data to

¹²⁵ The attractive force between two objects i and j depends on their masses M_i and M_j , the square distance between these objects D_{ij} and a gravitational constant G , which depends on the units of measurement for mass and attractive force: J. Walker and B. Unger, "Measuring Global Money Laundering: 'The Walker Gravity Model'", (2009) 5 Review of Law and Economics 821 at pp. 829-830.

estimate likely recorded crime figures. The model, at this stage, simply computes average crime rates per capita for each of 12 world regions, and these values are applied to the population figures for all countries without crime data, but there is considerable scope for more considered analysis.

(4) The model's current starting point for this stage [generating a percentage of proceeds of crime that have to be laundered] is the crime-specific estimates of money laundering, obtained in the 1995 Australia Transaction Reports and Analysis Centre (“**AUSTRAC**”) report on Australia. The best Australian estimate of total laundered money for each type of crime is divided by the numbers of those types of crimes recorded per year in Australia — to give an average amount of laundered money generated per recorded crime in Australia. Analysis of the Australian report produces the following approximate figures for money laundered per reported crime:

- \$50,000 per recorded fraud offence
- \$100,000 per recorded drug-trafficking offence
- \$400 per recorded theft
- \$600 per recorded burglary
- \$1,400 per recorded robbery
- \$225 per recorded homicide
- \$2.23 per recorded assault and sexual assault.

It is worth repeating that these figures are not estimates of the average amount of money laundered per actual crime, but per recorded crime. This inflates the figure considerably and will differ from country to country depending on the extent to which crimes are recorded by the authorities — a particularly difficult issue to resolve in the cases of drug crimes and frauds. These estimates for Australia so far have very few equivalents from other countries, but similar methods can eventually be used in other countries to broaden the picture.

(5) The figures initially resulting from step 4 take no account of the differences between countries in the 'profitability' of crime. Two factors are built into the model: the overall economic situation, as measured by the gross national product ("GNP") per capita, and a hypothesised relationship between the level of corruption in a country and the profitability of frauds.

On the question of the effect of the GNP, it is unreasonable to assume that, other things being equal, poor countries are as likely to generate high levels of criminal proceeds as richer countries. To take account of this, each country's figures from step 4 are factored up or down by data on gross national product per capita. To maintain consistency with the 1995 AUSTRAC report, Australia's GNP per capita is taken as 1.00, and others are pro-rated accordingly. Benchmarking studies are required to determine the nature of the relationship between GNP per capita and the proceeds of crime — it is quite probable that a linear relationship is not appropriate. For the time being, however, a linear proportionality is assumed in the model. That is, the proceeds per crime in any given country are assumed to be proportional to that country's GNP per capita.

Addressing the hypothesis that high levels of corruption may increase the amount of money laundered from frauds, even in countries with relatively low GNPs per capita, the Transparency International Corruption Index, transposed to a scale of 1 (low corruption) to 5 (high corruption), is used to factor up the fraud component of money laundering. For example, while low corruption countries use the Australian-based figure of 550,000 per recorded fraud offence, countries with very high levels of corruption, as measured by the TI Index, are effectively given a figure of up to five times this dollar amount. Again, this is an area in which significant new research is required.

(6) In the current model, the proportion laundered internally is calculated using the same 1-5 scale of corruption based on the TI Index, assuming that countries with high levels of corruption will allow money to be readily laundered in their own

economy and thereby reduce the need to launder in foreign countries. The formula incorporated into the model simply assumes that, for each point on this corruption scale, an additional 20 per cent of the money generated from crime is laundered locally. This results in highly corrupt countries (values approaching 5 on the scale) having 80—100 per cent laundered locally, while those with the lowest corruption scores (values only slightly above 1) have only 20-30 per cent laundered locally. Countries without any score on the TI index have been allocated a score equal to the average for their world trade region.

The assumptions currently used in step 6 need to be further addressed from a theoretical standpoint. The logic behind the decision to launder locally or launder in a foreign market does not appear to be well known or quantified. Other indicators, such as whether the country has any 'suspect transaction' legislation or monitoring agency, would perhaps be appropriate for inclusion in this formula.

(7) Finally, the model estimates how the foreign laundered part of the total generated in each country is distributed amongst the over 200 other countries around the world. The current assumption builds in four likely tendencies:

- that foreign countries with a tolerant attitude towards money laundering (eg those with banking secrecy laws or uncooperative government attitudes towards the prevention of money laundering) will attract a greater proportion of the funds than more vigilant countries;
- that high levels of corruption and/or conflict will deter money launderers, because of the risks of losing their funds;
- that countries with high levels of GNP/capita will be preferred by money launderers, since it would be easier to 'hide' their transaction; and
- that, other things being equal, geographic distance, and linguistic or cultural differences, work as deterrents to money launderers.

It is interesting to see the results of the first three of these assumptions, as they can be combined to form an 'index of attractiveness' to money launderers. The formula, in algebraic terms is:

$$\begin{aligned}
 \textit{Attractiveness to} \\
 \textit{Money} \\
 \textit{Launderers} &= [\textit{GNP per capita}] \\
 &\times [3 \times \textit{BankSecrecy} + \textit{GovAttitude} \\
 &+ \textit{SWIFTmember} - 3 \times \textit{Conflict} \\
 &- \textit{Corruption} + 15]
 \end{aligned}$$

where *GNP per capita* is measured in
US\$,
BankSecrecy is a scale from 0 (no secrecy
laws) to 5 (bank secrecy laws enforced),
GovAttitude is a scale from 0 (govern-
ment anti-laundering) to 4 (tolerant to
laundering),
SWIFTmember is 0 for non-member
countries and 1 for members of the SWIFT
international fund transfer network,
Conflict is a scale from 0 (no conflict
situation) to 4 (conflict situation exists),
Corruption is the modified Transparency
International Index (1 = low, 5 = high
corruption),
And the constant '15' is included to ensure
that all scores are greater than zero.

...

The final step in this process is to incorporate a "distance deterrence" assumption into the formula to determine how each country's outgoing money laundering is distributed amongst the 225 other countries. The formula used is:

$$\begin{aligned}
 \textit{Proportion of outgoing ML from country X to country Y} \\
 = \frac{\textit{Attractiveness score for Y}}{(\textit{Distance between country X and country Y})^2}
 \end{aligned}$$

...The use of the distances squared as a measure of deterrence uses empirically based regional economic analysis conventions, by which interactions between communities reduce according to the square of the distance between them. The geographical distance formula should, after further research, be replaced by a more complex “Index of Trading Proximity”, using a formula that would include, in addition to the geographic information, data on bilateral trade and finance, currency transaction reporting statistics, crossborder currency movement reporting figures, and on ethnic and linguistic linkages between countries. In addition, more sensitive measures of corruption, conflict and tolerance of money laundering, including perhaps suspicious activity report statistics, need to be developed.¹²⁶

68. The Walker Gravity model has been tweaked with respect to the Attractiveness and Distance indices, but the method used to generate the volume of money laundered has not changed: it relies on crime statistics to get a total proceeds of crime from reported crimes and on expert opinion as to the percentage of total proceeds of crime that require laundering.¹²⁷

¹²⁶ J. Walker, “How Big is Global Money Laundering?”, (1999) 3 *Journal of Money Laundering Control* 25 at pp. 27-33.

¹²⁷ B. Unger, M. Siegel, J. Ferwerda, W. de Kruijf, M. Busuioic, K. Wokke and G. Rawlings, *Amounts and the Effects of Money Laundering*, Report for Netherlands Ministry of Finance, February 16, 2006; J. Walker and B. Unger, “Measuring Global Money Laundering: ‘The Walker Gravity Model’”, (2009) 5 *Review of Law and Economics* 821; United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>; European Commission DG Home Affairs, Project “ECOLEF”: The Economic and Legal Effectiveness of Anti-Money Laundering and Combating Terrorist Financing Policy, European Commission, JLS/2009/ISEC/AG/087, February 2013, available online at <[http://www2.econ.uu.nl/users/unger/ecolef_files/Final%20ECOLEF%20report%20\(digital%20version\).pdf](http://www2.econ.uu.nl/users/unger/ecolef_files/Final%20ECOLEF%20report%20(digital%20version).pdf)>; J. Ferwerda, M. Kattenberg, H.-H. Chang, B. Unger, L. Groot, L. and J.A. Bikker, “Gravity models of trade-based money laundering”, (2013) 45 *Applied Economics* 3170; H. Balani, J.J. Lewer and M. Saenz, “Trade Based Money Laundering in Select Asian Economies: A Comparative Approach Using the Gravity Model”, (2017) 1 *South West Economic Review* 15; W.A. Khan, S.T. Jawaid and I. Arif, “Where does a nation’s wealth go? Evidence from a third world country” (2018) 21 *Journal of Money Laundering Control* 426; J. Ferwerda, A. van Saase, B. Unger and M. Getzner, *Money Laundering or Money just Flowing Through? Estimating Money Laundering with a Gravity Model Based Simulation*, Working paper for iCOV, 2019.

69. Unger et al. 2006 modified the Distance variable in the model. Where Walker 1999 used physical distance between countries, Unger et al. 2006 considered physical distance less important for money laundering flows because money cannot perish, transportation costs for money are often negligible and cultural barriers may play a role in determining the flow of illicit funds.¹²⁸ If two countries speak the same language, if they share a common colonial background and if they are top trading partners for each other, then they have more common links and so are less “distant” from each other, than if they do not have these joint experiences.¹²⁹ The closer countries are to each other, the lower the distance between them, the more laundering will take place. Thus, in addition to physical distance, each country’s language and colonial background was used in Unger et al. 2006’s version of the model.¹³⁰ Unger et al. 2006 also modified the Attractiveness variable to include Financial Deposits and whether a country is a member of the Egmont Group.¹³¹ The Unger et al. 2006 version of the model was also used in a 2009 paper by Professor Unger and John Walker.¹³²

70. In summary, the formula of Walker 1999 was modified by Unger et al. 2006 as follows:

¹²⁸ B. Unger, M. Siegel, J. Ferwerda, W. de Kruijf, M. Busuioic, K. Wokke and G. Rawlings, *Amounts and the Effects of Money Laundering*, Report for Netherlands Ministry of Finance, February 16, 2006; J. Walker and B. Unger, “Measuring Global Money Laundering: ‘The Walker Gravity Model’”, (2009) 5 *Review of Law and Economics* 821 at p. 829 at p. 833.

¹²⁹ J. Walker and B. Unger, “Measuring Global Money Laundering: ‘The Walker Gravity Model’”, (2009) 5 *Review of Law and Economics* 821 at p. 829 at p. 842.

¹³⁰ J. Walker and B. Unger, “Measuring Global Money Laundering: ‘The Walker Gravity Model’”, (2009) 5 *Review of Law and Economics* 821 at p. 829 at pp. 841-842.

¹³¹ The Egmont Group is an organisation that meets in the Dutch village Egmont aan de Zee to discuss how to combat money laundering: J. Walker and B. Unger, “Measuring Global Money Laundering: ‘The Walker Gravity Model’”, (2009) 5 *Review of Law and Economics* 821 at p. 829 at p. 842. It is made up of national Financial Intelligence Units fighting money laundering in compliance with the Financial Action Task Force recommendations: H. Balani, J.J. Lewer and M. Saenz, “Trade Based Money Laundering in Select Asian Economies: A Comparative Approach Using the Gravity Model”, (2017) 1 *South West Economic Review* 15 at p. 19.

¹³² J. Walker and B. Unger, “Measuring Global Money Laundering: ‘The Walker Gravity Model’”, (2009) 5 *Review of Law and Economics* 821.

Percentage of World Criminal Money Flowing Into a Country X (The Netherlands)

$$P(X, y_i) = \frac{1}{\sum_{i=1}^n \left[\frac{\text{attractiveness}(y_i)}{\text{dist}(X, y_i)} \right]} \times \frac{\text{attractiveness}(y_i)}{\text{dist}(X, y_i)}$$

Country X, countries y_i $i=1 \dots n$ Attractiveness = f (GDP per capita, Bank Secrecy, Anti-Money Laundering Policy, SWIFT Membership, **Financial Deposits**, Conflict, Corruption, **Egmont Group**)¹¹Distance deterrence = f (**Language**, **Colonial Background**, Physical Distance)

(Changes in the components of the Attractiveness and Distance variables from the Walker 1999 model are in **bold**.)

71. In 2011, John Walker and Thomas Pietschmann authored a report for the United Nations Office on Drugs and Crime (“**UNDOC**”): *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes (“UNDOC 2011 Report”)*.¹³³ To develop estimates of the extent to which proceeds from cocaine trafficking enter the financial system, the UNODC 2011 Report used crime statistics to first estimate the proceeds of crime for cocaine.¹³⁴ Then, to generate the proportion of proceeds laundered from cocaine trafficking, the report reviewed literature reports and: (1) estimated the number of traffickers involved at the retail and wholesale levels in key countries; (2) analysed the market structure; and (3) applied the analysed market structure and introduced a cut-off rate for “reasonable living expenses” above which drug traffickers were able to launder money to the estimated number of traffickers at the retail and wholesale levels.¹³⁵

¹³³ United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

¹³⁴ United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at pp. 51 and 55, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

¹³⁵ United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at pp. 52 and 70, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

72. Finally, the UNDOC 2011 Report applied a Walker Gravity model formula similar to the one used by Walker and Unger 2009 to determine the main destinations of laundered funds.¹³⁶ Attractiveness was determined by GDP per capita, the size of the financial service sector, foreign direct investment inflow per GDP 2009, a rule of law proxy, a human development proxy, the Financial Action Task Force Compliance Index and an estimate of the shadow economy as a percentage of GDP. Distance was as per Walker and Unger 2009. Calibration of the model (i.e. weighting the individual parameters) was partly based on research in the field and partly based on cross-checking results with other data sets.

73. Unger et al. 2013 used the Walker Gravity model as described in Unger et al. 2006 and Walker and Unger 2009 to estimate the threat of money laundering in specific countries.¹³⁷ The study looked to published data estimating the annual proceeds of crime in countries around the world for different types of crime and applied estimates for the percentage laundered from the earlier works by Walker and/or Unger and her associates.¹³⁸

74. Ferwerda et al. 2013 examined the robustness of the Walker Gravity model to estimate trade-based money laundering related to the United States and its trading partners.¹³⁹ They also extended the Walker Gravity model to include an additional money laundering policy variable: government attitude. The authors (who included

¹³⁶ United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 92, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

¹³⁷ European Commission DG Home Affairs, *Project "ECOLEF": The Economic and Legal Effectiveness of Anti-Money Laundering and Combating Terrorist Financing Policy*, European Commission, JLS/2009/ISEC/AG/087, February 2013 at p. 40, available online at <[http://www2.econ.uu.nl/users/unger/ecolef_files/Final%20ECOLEF%20report%20\(digital%20version\).pdf](http://www2.econ.uu.nl/users/unger/ecolef_files/Final%20ECOLEF%20report%20(digital%20version).pdf)>.

¹³⁸ European Commission DG Home Affairs, *Project "ECOLEF": The Economic and Legal Effectiveness of Anti-Money Laundering and Combating Terrorist Financing Policy*, European Commission, JLS/2009/ISEC/AG/087, February 2013 at pp. 36-38, available online at <[http://www2.econ.uu.nl/users/unger/ecolef_files/Final%20ECOLEF%20report%20\(digital%20version\).pdf](http://www2.econ.uu.nl/users/unger/ecolef_files/Final%20ECOLEF%20report%20(digital%20version).pdf)>.

¹³⁹ J. Ferwerda, M. Kattenberg, H.-H. Chang, B. Unger, L. Groot and J.A. Bikker, "Gravity models of trade-based money laundering" (2013) 45 *Applied Economics* 3170.

Professor Unger) concluded that the specific values (or weighting) of parameters used in the Walker Gravity model by Walker and Unger 2009 were not suitable for estimating trade-based money laundering although they could explain trade-based money laundering flows worldwide in a plausible manner.¹⁴⁰ Trade-based money laundering flows were best explained by GDP, trade, distance, Egmont-membership and government attitude.¹⁴¹ The latter two, however, had the opposite effect than was hypothesised by Walker and Unger 2009.

75. Balani et al. 2017 used the Walker Gravity Model to estimate trade flows and illicit financial flows in certain Asian economies based on Government attitude measured in terms of number of prosecutions and convictions reflected in court cases.¹⁴² Court cases included those that specifically referenced money laundering, tax evasion and corruption.

76. In 2018, Khan et al. applied the Walker Gravity model from Unger et al. 2006 to estimate the amount of money laundered from Pakistan through 156 countries.¹⁴³ They used 3.7% of GDP, estimated for Asian countries by a Global Financial Integrity report on illicit financial flows from developing countries for 2003-2012, to get a number for the amount to be laundered from total proceeds of crime.¹⁴⁴ The IMF 1998 estimate and the UNODC 2011 Report were also used as justification for the 3.7% of GDP figure.¹⁴⁵

¹⁴⁰ J. Ferwerda, M. Kattenberg, H.-H. Chang, B. Unger, L. Groot and J.A. Bikker, "Gravity models of trade-based money laundering" (2013) 45 Applied Economics 3170 at p. 3170.

¹⁴¹ J. Ferwerda, M. Kattenberg, H.-H. Chang, B. Unger, L. Groot and J.A. Bikker, "Gravity models of trade-based money laundering" (2013) 45 Applied Economics 3170 at p. 3177.

¹⁴² H. Balani, J.J. Lewer and M. Saenz, "Trade Based Money Laundering in Select Asian Economies: A Comparative Approach Using the Gravity Model", (2017) 1 South West Economic Review 15 at p. 18.

¹⁴³ W.A. Khan, S.T. Jawaid and I. Arif, "Where does a nation's wealth go? Evidence from a third world country" (2018) 21 Journal of Money Laundering Control 426.

¹⁴⁴ . Dar and J. Spanjers, *Illicit Financial Flows from Developing Countries: 2003-2012*, Global Financial Integrity, December 2014, available online at: <https://secureservercdn.net/45.40.149.159/34n.8bd.myftpupload.com/wp-content/uploads/2014/12/Illicit-Financial-Flows-from-Developing-Countries-2003-2012.pdf?time=1576152230>.

¹⁴⁵ W.A. Khan, S.T. Jawaid and I. Arif, "Where does a nation's wealth go? Evidence from a third world country" (2018) 21 Journal of Money Laundering Control 426 at p. 437.

77. In 2019, New Zealand's Police Financial Intelligence Unit released its *National Risk Assessment of Money Laundering and Terrorism Financing*.¹⁴⁶ The threat analysis used two methods adapted from research by John Walker to generate an estimate of the scale of illicit proceeds for laundering. The estimates excluded tax offending and overseas predicate offences.

78. Also in 2019, Professors Maureen Maloney, Tsur Somerville and Brigitte Unger provided a report ("**Maloney Report**") to the British Columbia Minister of Finance about money laundering in the British Columbia real estate sector.¹⁴⁷ The Maloney Report estimated the amount of money laundering in Canada and in British Columbia using the Walker Gravity model.

Advantages and disadvantages of using the Walker Gravity model to quantify money laundering

79. Two advantages of the Walker Gravity model are the approach avoids double-counting and is easy to understand.¹⁴⁸ Also, the procedure can be used for all countries and jurisdictions in the world.¹⁴⁹ Moreover, it combines expertise from criminology, economics and finance.

80. However, there are a number of criticisms of the Walker Gravity Model.

¹⁴⁶ New Zealand Police, *National Risk Assessment of Money Laundering and Terrorism Financing*, New Zealand Police Financial Intelligence Unit, 2019, available online at: <https://www.police.govt.nz/sites/default/files/publications/fiu-nra-2019.pdf>.

¹⁴⁷ M. Maloney, T. Somerville and B. Unger, *Combating Money Laundering in BC Real Estate*, Expert Panel on Money Laundering in BC Real Estate, 2019.

¹⁴⁸ N. Hednriyetty and B.S. Grewal, "Macroeconomics of money laundering: effects and measurements", (2017) 24 *Journal of Financial Crime* 66 at p. 75; P.C. Van Duyne, J.H. Harvey, L.Y. Gelemerova, *The Critical Handbook of Money Laundering: Policy, Analysis and Myths* (London, Palgrave Macmillan, 2018) at p. 213.

¹⁴⁹ J. Walker and B. Unger, "Measuring Global Money Laundering: 'The Walker Gravity Model'", (2009) 5 *Review of Law and Economics* 821 at p. 829. See also W.A. Khan, S.T. Jawaid and I. Arif, "Where does a nation's wealth go? Evidence from a third world country" (2018) 21 *Journal of Money Laundering Control* 426 at p. 435.

81. First, using proceeds of crime to estimate money laundering is contingent on access to solid quantitative data related to predicate offences.¹⁵⁰ The model relies on estimates of the amount of different types of crime to get an estimate of proceeds of crime. Khan et al. 2018 noted the major limitation of the Walker Gravity model was the non-availability of reliable data as money laundering activities are hidden.¹⁵¹ Reliable data is either not available officially or not consistent and available data only reflect aspects of money laundering that are reported. Crime reporting is highly uneven across countries, particularly for bribery, corruption and tax evasion. There is thus likely a large margin of error in Walker Gravity model money laundering estimates because of the lack of measured data and inconsistencies in international data.¹⁵²

82. Also, crime money in the model covers all income from crime, but further uncertainty slips in because of tax fraud and illegal savings from non-compliance (e.g. illegal savings by environmental crime).¹⁵³ Given the estimated size of tax fraud and other economic crimes, this undermines much of the Walker Gravity model.

83. Second, the reliability and accuracy of the Walker Gravity model is contingent on an ability to estimate the percentage of proceeds being laundered for various types of crimes.¹⁵⁴ The Walker Gravity model uses Walker 1999's percentages of the amount of proceeds from various predicate crime that are laundered. Walker came up with these percentages based on a 1995 AUSTRAC report for crime in Australia.¹⁵⁵ Exactly how Walker came up with these percentages has never been expressly explained.

¹⁵⁰ M. Maloney, T. Somerville and B. Unger, *Combatting Money Laundering in BC Real Estate*, Expert Panel on Money Laundering in BC Real Estate, 2019 at p. 46.

¹⁵¹ W.A. Khan, S.T. Jawaid and I. Arif, "Where does a nation's wealth go? Evidence from a third world country" (2018) 21 *Journal of Money Laundering Control* 426 at p. 426.

¹⁵² M. Maloney, T. Somerville and B. Unger, *Combatting Money Laundering in BC Real Estate*, Expert Panel on Money Laundering in BC Real Estate, 2019 at pp. 46-47.

¹⁵³ P. van Duyne, "(Transnational) Organised Crime, Laundering and the Congregation of the Gullible", Valedictory, Tilburg University, March 14, 2011 at p. 27, available online at: <<http://www.petrusvandyne.nl/wp-content/uploads/2017/08/Afscheidsrede-Valedictory.pdf>>.

¹⁵⁴ M. Maloney, T. Somerville and B. Unger, *Combatting Money Laundering in BC Real Estate*, Expert Panel on Money Laundering in BC Real Estate, 2019 at p. 46.

¹⁵⁵ J. Walker, "How Big is Global Money Laundering?", (1999) 3 *Journal of Money Laundering Control* 25 at p. 28.

84. Furthermore, as Walker 1999 emphasised, his figures were not estimates of the average amount of money laundered per actual crime, but per recorded crime, which inflated the figure considerably, differs from country to country depending on the extent to which crimes are recorded by the authorities and is a particularly difficult issue to resolve in cases of drug crimes and frauds.¹⁵⁶ The amounts estimated applying Walker 1999's percentages of the proceeds of crime that are laundered also take no account of the differences between countries in the profitability of crime.

85. In the UNDOC 2011 Report, Walker acknowledged that despite his more developed technique to estimate the percentage of the proceeds of crime from cocaine trafficking, the estimate could not be applied to other crime sectors without additional knowledge about the operations of the actors in the specific crime market.¹⁵⁷ Thus, while the Walker Gravity model used in the UNDOC 2011 Report was a quantitative risk assessment tool, the results should be treated with caution.

86. Professors van Duyne and Reuter fault the method's use of experts (i.e. policemen) to estimate how much money is gained from particular categories of crime and how much of that is laundered.¹⁵⁸ The approach seriously compromises the basic measurement requirements of validity and reliability, given the potentially uncontrolled bias of those non-calibrated "experts". Recalculating police estimates in criminal cases, van Duyne et al. 2018 frequently had to size down much of the net profits while using the same underlying evidence as the detectives and the same applies to data on prosecutions and trials. Reuter argues the Walker Gravity model's estimates of crime

¹⁵⁶ J. Walker, "How Big is Global Money Laundering?", (1999) 3 *Journal of Money Laundering Control* 25 at p. 28.

¹⁵⁷ United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 96, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

¹⁵⁸ P. van Duyne, "(Transnational) Organised Crime, Laundering and the Congregation of the Gullible", Valedictory, Tilburg University, March 14, 2011 at p. 28, available online at: <<http://www.petrusvandyne.nl/wp-content/uploads/2017/08/Afscheidsrede-Valedictory.pdf>>; P.C. Van Duyne, J.H. Harvey, L.Y. Gelemerova, *The Critical Handbook of Money Laundering: Policy, Analysis and Myths* (London, Palgrave Macmillan, 2018) at p. 214; P. Reuter, "Are estimates of the volume of money laundering either feasible or useful?", *Research Handbook on Money Laundering*, B. Unger and D. van der Linde, eds. (Cheltenham, UK: Edward Elgar, 2013) at pp. 227 and 229-230.

rates for fraud are unreliable and based on small response rate surveys of experts that are unable to provide reliable answers.¹⁵⁹

87. Professors Walker and Unger admit that expert surveys suffer from diverse biases.¹⁶⁰ The expert sample might not be representative and the people interviewed may have their own perception biases, such as an overestimation of money laundering by authorities responsible for combating it or an underestimation if law enforcement / regulators feel they fight crime efficiently. Other biases relate to interpretation biases, biases because of non-response to the surveys / interviews and sample biases.

88. Third, as acknowledged by Walker and Unger 2009, their approach is *ad hoc* and not underpinned by any economic theory.¹⁶¹ Walker and Unger 2013 stated that a better micro-foundation for the Walker Gravity model was needed and that for this, the behaviour of money launderers, including what makes them send their money to a specific country is important.¹⁶² For example, if Italian launderers always send their drug money only to Turkey or if Dutch launderers only send their ecstasy pill proceeds only to the United Kingdom, then the Walker Gravity model, which assumes a large spread of money flows, will be inaccurate. There has not yet been a modification of the Walker Gravity model to provide better insight into the behaviour of money launderers.

89. Fourth, there are problems with the Walker Gravity model's mathematical specifications. The Maloney Report stated the model's mathematical specification may

¹⁵⁹ P. Reuter, "Are estimates of the volume of money laundering either feasible or useful?", *Research Handbook on Money Laundering*, B. Unger and D. van der Linde, eds. (Cheltenham, UK: Edward Elgar, 2013) at pp. 227 and 229-230.

¹⁶⁰ J. Walker and B. Unger, "Measuring Global Money Laundering: 'The Walker Gravity Model'", (2009) 5 *Review of Law and Economics* 821 at p. 828; United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research Report, October 2011 at p. 15, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

¹⁶¹ J. Walker and B. Unger, "Measuring Global Money Laundering: 'The Walker Gravity Model'", (2009) 5 *Review of Law and Economics* 821 at pp. 834 and 849-850. See also J. Walker and B. Unger, "Measuring global money laundering: the 'Walker Gravity Model'" in *Research Handbook on Money Laundering*, B. Unger and D. van der Linde, eds. (Cheltenham, UK, 2013) at pp. 169-170.

¹⁶² J. Walker and B. Unger, "Measuring global money laundering: the 'Walker Gravity Model'" in *Research Handbook on Money Laundering*, B. Unger and D. van der Linde, eds. (Cheltenham, UK, 2013) at pp. 169-170.

have resulted in systematic inaccuracies in estimates of money laundering in Canada and British Columbia because the model had to be simple enough to use the data available for all countries (or within Canada, for all regions) and this limited accuracy.¹⁶³ Estimated model parameters that may work when applied across a range of countries in the world may be less accurate when applied to a subset of countries or regions.¹⁶⁴ For example, while model parameters based on economic data will vary across Canada, other parameters used to calculate Attractiveness like the rule of law and the banking system will not differ and this means the model gave greater weight to parameters like provincial GDP and crime rates.

90. The Walker Gravity model's extrapolation from the arithmetic mean is a problem because it requires a higher measurement level than is allowed in this kind of research and the frequency distribution of criminal income is invariably skewed: a high frequency of low-income criminals and a few high earners.¹⁶⁵ Using the average with such a skewed frequency distribution of criminal wealth and related money-flows leads to systematic overestimation.¹⁶⁶

91. Fifth, the model's outcomes are not tested against other external variables.

92. Sixth, and finally, the model's estimates are dependent on its parameter weighting (also called the calibration of the model) for the Attractiveness and Distance indicators, but this weighting is arbitrary.¹⁶⁷ The Walker Gravity model's Attractiveness

¹⁶³ M. Maloney, T. Somerville and B. Unger, *Combatting Money Laundering in BC Real Estate*, Expert Panel on Money Laundering in BC Real Estate, 2019 at p. 47.

¹⁶⁴ M. Maloney, T. Somerville and B. Unger, *Combatting Money Laundering in BC Real Estate*, Expert Panel on Money Laundering in BC Real Estate, 2019 at p. 47.

¹⁶⁵ P.C. van Duyne, "(Transnational) Organised Crime, Laundering and the Congregation of the Gullible", Valedictory, Tilburg University, March 14, 2011 at p. 28, available online at:

<<http://www.petrusvanduyne.nl/wp-content/uploads/2017/08/Afscheidsrede-Valedictory.pdf>>; P.C. van Duyne, "Crime-money and financial conduct", *Research Handbook on Money Laundering*, B. Unger and D. van der Linde, eds. (Cheltenham, UK: Edward Elgar, 2013) at p. 248.

¹⁶⁶ P.C. van Duyne, "Crime-money and financial conduct", *Research Handbook on Money Laundering*, B. Unger and D. van der Linde, eds. (Cheltenham, UK: Edward Elgar, 2013) at p. 248.

¹⁶⁷ J. Walker and B. Unger, "Measuring Global Money Laundering: 'The Walker Gravity Model'", (2009) 5 *Review of Law and Economics* 821 at pp. 849-850; United Nations Office on Drugs and Crime, *Estimating illicit financial flows resulting from drug trafficking and other transnational organized crimes*, Research

indicators are hypothetical rather than fact-based.¹⁶⁸ Weighting of the Attractiveness variable was never based on statistical estimates; it only used values of an “inspirational guess”.¹⁶⁹ Levi et al. 2018 said the Walker Gravity model makes some highly questionable high-end guesstimates based on “heroic” assumptions and extrapolations.¹⁷⁰ The authors speculated that heavy criticism of the Walker Gravity model may have lead the FATF assessor body looking at the Netherlands to create its own estimate of the components of the proceeds of crime.¹⁷¹

93. Ferwerda et al. 2019 tried to remedy the fact that the Walker Gravity model uses untested weightings of parameters.¹⁷² They used a unique dataset of suspicious transactions provided by the Dutch Institute infobox Criminal and Unexplained Wealth (“iCOV”) (which had all STRs filed in the Netherlands from 2009-2014) as a proxy for all money laundering transactions, to test the Walker Gravity model weightings.¹⁷³ Using the dataset as a proxy for laundering on the left-hand side of the Walker Gravity equation the authors estimated the relevant coefficients on the right-hand side of the equation (the country preferences of money launderers).

94. Then, Ferwerda et al. 2019 took the estimates of the parameters on the right-hand side of the Walker Gravity model equation and simulated money laundering flows around the world in an iterative way. The authors said this allowed differentiation

Report, October 2011 at p. 95, available online at: <https://www.unodc.org/documents/data-and-analysis/Studies/Illicit_financial_flows_2011_web.pdf>.

¹⁶⁸ P.C. Van Duyne, J.H. Harvey, L.Y. Gelemerova, *The Critical Handbook of Money Laundering: Policy, Analysis and Myths* (London, Palgrave Macmillan, 2018) at p. 216.

¹⁶⁹ J. Ferwerda, M. Kattenberg, H.-H. Chang, B. Unger, L. Groot and J.A. Bikker, “Gravity models of trade-based money laundering” (2013) 45 *Applied Economics* 3170 at p. 3170.

¹⁷⁰ M. Levi, P. Reuter and T. Halliday, “Can the AML System be evaluated without better data?”, (2018) 69 *Crime Law Social Change* 307 at p. 311.

¹⁷¹ M. Levi, P. Reuter and T. Halliday, “Can the AML System be evaluated without better data?”, (2018) 69 *Crime Law Social Change* 307 at p. 318.

¹⁷² J. Ferwerda, A. van Saase, B. Unger and M. Getzner, *Money Laundering or Money just Flowing Through? Estimating Money Laundering with a Gravity Model Based Simulation*, Working paper for iCOV, 2019.

¹⁷³ J. Ferwerda, A. van Saase, B. Unger and M. Getzner, *Money Laundering or Money just Flowing Through? Estimating Money Laundering with a Gravity Model Based Simulation*, Working paper for iCOV, 2019 at p. 9.

between domestic money laundering, money only flowing through and international money laundering settling down in a country.

95. The Ferwerda et al. 2019 work did not address other problems with the Walker Gravity model related to the unreliability of crime statistics, the unreliability of estimates of proceeds of crime that are laundered, the lack of economic theory underpinning the approach and issues with the model's mathematical specifications.

J. What estimates of money laundering are there for British Columbia?

96. Three provincial government agencies have commissioned independent consultants and/or experts to look at money laundering in British Columbia: (1) the British Columbia Gaming Policy and Enforcement Branch ("**GPEB**") had MNP LLP look at money laundering in casinos; (2) the Minister of Finance had Professors Maloney, Sommerville and Unger look at money laundering in the British Columbia real estate sector; and (3) the Attorney General had Peter German & Associates Inc. investigate the risk of money laundering in the provincial real estate, luxury vehicle sales and horse racing sectors. Of these three reports, only the Maloney Report provides a dollar estimate of money laundering, although the other two reports consider the extent of the risk of money laundering in specified industries.

97. In a more limited way, the RCMP have looked at the extent of money laundering in British Columbia.

98. The three provincial reports and the RCMP work is summarised below. As noted above, of the above British Columbia-specific studies, only the Maloney Report, and to a much lesser extent, the RCMP work, attempt to estimate money laundering in the province. However, summaries of all three reports are included in this Overview Report, along with a summary about the RCMP estimates, because each report, to a greater or lesser degree, says something about efforts to look at the extent of the problem in British Columbia. Quantifying money laundering is a means to the end of understanding the extent of money laundering. Thus, to the extent that the three provincial reports

touch on understanding the *extent* of money laundering in British Columbia (including how difficult it may be to do so), they are relevant to this Overview Report, even though they do not speak to quantification methods.

K. MNP LLP Report

99. In 2015, the GPEB engaged MNP LLP to work with senior GPEB managers to review practices at casinos regarding source of funds, source of wealth, handling of cash, use of cash alternatives and overall Customer Due Diligence in gaming facilities compared to financial institutions, review best practices in the gaming sector in relation to the “know your customer” framework in British Columbia, assess the British Columbia Lottery Corporation (“**BCLC**”)’s Customer Due Diligence regime and compliance with this regime and identify near term actions and longer term recommendations (“**MNP LLP Report**”).¹⁷⁴ Quantification of the amount of money laundering was not within the scope of the review, but data on reportable cash transactions or play records from September 1, 2013 to August 31, 2015 were reviewed to estimate volumes of unsourced cash being accepted at one casino, River Rock Casino Resort.¹⁷⁵ These data were Large Cash Transaction Reports, STRs and records of players banned at least in part because of large and frequent play with unsourced cash.

100. The MNP LLP Report identified an error in BCLC’s statistical reporting, which resulted in significant over-reporting of non-cash transactions to FinTRAC.¹⁷⁶ Because this overreporting was included in the 2013 to 2015 dataset, MNP LLP was unable to determine the actual number and amounts of large cash transactions. This in turn, limited its ability to get reliable results from its data analysis. No estimate of the amount

¹⁷⁴ MNP LLP, *British Columbia Gaming Policy Enforcement Branch: AML Report*, July 26, 2016 at p. 3, available online at: <https://www2.gov.bc.ca/assets/gov/sports-recreation-arts-and-culture/gambling/gambling-in-bc/reports/mnp_report-redacted.pdf>.

¹⁷⁵ MNP LLP, *British Columbia Gaming Policy Enforcement Branch: AML Report*, July 26, 2016 at pp. 7 and 15, available online at: <https://www2.gov.bc.ca/assets/gov/sports-recreation-arts-and-culture/gambling/gambling-in-bc/reports/mnp_report-redacted.pdf>.

¹⁷⁶ MNP LLP, *British Columbia Gaming Policy Enforcement Branch: AML Report*, July 26, 2016 at pp. 8 and 15, available online at: <https://www2.gov.bc.ca/assets/gov/sports-recreation-arts-and-culture/gambling/gambling-in-bc/reports/mnp_report-redacted.pdf>.

of money laundering at River Rock Casino Resort (or any casino) was made. MNP LLP's observations based on the dataset were limited to the following:

1. patrons with non-Canadian addresses and identification, primarily Chinese, were playing with a significant volume of cash; and
2. while significant volumes of Large Cash Transaction Reports were filed during the period reviewed, the number of STRs filed was relatively small and the number of bans for potential money laundering was few.¹⁷⁷

L. Maloney Report

101. Using the Walker Gravity model, the Maloney Report estimated annual money laundering activity in Canada in 2015 at \$41.3 billion and in 2018 at \$46.7 billion.¹⁷⁸ For British Columbia, the estimates for 2015 and 2018 were \$6.3 billion and \$7.4 billion, respectively.

102. The Maloney Report also generated ranges of how much of the estimated money laundering flow in British Columbia were invested in provincial real estate.¹⁷⁹ The first range was based on the proportion of laundered money in real estate assuming all money laundering flows were either: (1) income subject to decisions about consumption and investment; or (2) intended to be invested. The resulting range was \$2.1 billion to \$7.4 billion. The other range was based on a wealth portfolio allocation approach. Based on data indicating portfolio allocation to real estate varied from 37 to 72%, and assuming 28% or 100% of all money laundered was invested, the top bound was \$2.7 to \$5.3 billion and the bottom bound was \$0.8 to \$5.3 billion.

¹⁷⁷ MNP LLP, *British Columbia Gaming Policy Enforcement Branch: AML Report*, July 26, 2016 at pp. 15-16, available online at: <https://www2.gov.bc.ca/assets/gov/sports-recreation-arts-and-culture/gambling/gambling-in-bc/reports/mnp_report-redacted.pdf>.

¹⁷⁸ M. Maloney, T. Somerville and B. Unger, *Combatting Money Laundering in BC Real Estate*, Expert Panel on Money Laundering in BC Real Estate, 2019 at pp. 1 and 47-48.

¹⁷⁹ M. Maloney, T. Somerville and B. Unger, *Combatting Money Laundering in BC Real Estate*, Expert Panel on Money Laundering in BC Real Estate, 2019 at pp. 50-52.

103. The Maloney Report said the use of suspicious transactions in real estate via “money laundering flags” might be used to identify the amount of money laundering.¹⁸⁰ But, applying broad indicators (flags) associated with money laundering to existing data sets was difficult because details of real estate transactions that might be flags were often found in disparate data sources or were not readily identifiable. There was also an absence of a data bank of money laundering activities and characteristics of transactions proven to be related to money laundering.

104. Nevertheless, the Maloney Report did some sample calculations of money laundering using publicly available land data from the Land Title Registry and from the British Columbia Property Assessment Roll. They chose three indicators that could be easily identified in these data and that were supported by real estate money laundering flags identified by the FATF as follows:

1. ownership of real estate by legal persons;
2. purchase or ownership of properties without a mortgage; and
3. financing of real estate with mortgages from individuals or unregulated lenders.

105. Based on this work, the authors concluded that: (1) beneficial ownership disclosure was needed to make ownership by legal persons a useful indicator; and (2) purchase / ownership without a mortgage was unlikely to be a useful indicator because it was so common across the province and there were *bona fide* legal reasons for using unregulated lenders. The Maloney Report suggested it might be necessary to combine indicators, including indicators based on data from other sources (e.g. STRs), to narrow results.

M. German Reports

¹⁸⁰ M. Maloney, T. Somerville and B. Unger, *Combatting Money Laundering in BC Real Estate*, Expert Panel on Money Laundering in BC Real Estate, 2019 at pp. 58-60.

106. Peter German, Q.C., and Peter German & Associates Inc. delivered to government the report, *Dirty Money – Part 1: An Independent Review of Money Laundering in Lower Mainland Casinos* conducted for the Attorney General of British Columbia, on March 31, 2018 (“German Report 1”).¹⁸¹ They delivered the report to government, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, on March 31, 2019 (“German Report 2”).¹⁸² The German Reports were commissioned by the Attorney General of British Columbia to assess money laundering risk and vulnerabilities in the named sectors.

107. The quantity of money laundering in each sector investigated was not estimated, but the Reports assessed whether money laundering was a risk in each sector.

Casinos

108. The German Report 1 reviewed the casino sector. The authors interviewed BCLC personnel, GPEB personnel, casino personnel, law enforcement personnel, federal and provincial government ministry and agency staff, stakeholder groups and other individuals. They examined BCLC and GPEB policies and other documents and did a literature review. The authors also did site visits. The German Report 1 did not estimate the amount of money laundering in British Columbian casinos, but it concluded large-scale, transnational money laundering had been occurring.¹⁸³

Real estate

¹⁸¹ P. German and Peter German & Associates Inc., *Dirty Money – Part 1: An Independent Review of Money Laundering in Lower Mainland Casinos* conducted for the Attorney General of British Columbia, March 31, 2018.

¹⁸² P. German and Peter German & Associates Inc., *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019.

¹⁸³ P. German and Peter German & Associates Inc., *Dirty Money – Part 1: An Independent Review of Money Laundering in Lower Mainland Casinos* conducted for the Attorney General of British Columbia, March 31, 2018, p. 13.

109. The German Report 2 combined data from the Land Title and Survey Authority of British Columbia (“**LTSA**”), BC Assessment and from the Multiple Listing Service.¹⁸⁴ Money laundering indicators were then identified from the literature (academic papers, white papers and advisory notices from regulators and law enforcement and real estate-focused publications from the FATF and the Organization for Economic Co-operation and Development). Fourteen indicators in four categories were analysed using the combined datasets (more than 1.2 million properties) and then tested against a sample of 154 properties compiled from civil forfeiture cases and information obtained by the authors, which related to alleged money laundering or other criminal activity. The indicators were:

1. ownership:
 - a. ownership by a legal entity or arrangement;
 - b. ownership by a nominee;¹⁸⁵
 - c. ownership by an overseas buyer;
 - d. ownership by a buyer from a high-risk jurisdiction;
 - e. title holder uses an opaque address;
2. financing:¹⁸⁶
 - a. purchase does not involve external financing;

¹⁸⁴ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at pp. 68-70.

¹⁸⁵ The German Report 2 could not identify nominee owners with publicly available real estate data and therefore the authors used occupation as a proxy for the nominee variable. Owners with occupations of “student”, “homemaker” and “unemployed” were designated as nominee owners. The Report acknowledged the nominee analysis almost certainly included false positives and excluded nominee owners who listed other occupations on title: P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at pp. 79 and 108.

¹⁸⁶ The German Report 2 noted several financing indicators required information were impacted by data limitations so the authors could only analyse a sample of about 126,000 mortgages registered since 2011: P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at p. 90. This sample was not proportionally distributed across years or categories of residential real estate.

- b. mortgage with an unregulated lender;
 - c. mortgages from overseas lenders;
 - d. mortgage discharged quickly;
 - e. multiple mortgages registered and discharged;
 - f. mortgage with an unusual loan-to-value ratio;
3. valuations: property is overvalued or undervalued;
4. transactions:
- a. property flipped multiple times; and
 - b. buyer has acquired multiple properties in a brief period.

110. The German Report 2 noted British Columbia, and the Lower Mainland in particular, have a real estate market in which many conventional money laundering indicators do not apply.¹⁸⁷ Speculative investment activity, an influx of foreign capital and rapid appreciation make it difficult to identify suspicious transactions. Also, the German Report 2 was limited to indicators that could be analysed through data sources available to the authors.¹⁸⁸ Further, there were data access and quality issues.¹⁸⁹ The German Report 2 only focused on residential properties because real estate transactions in the commercial sector did not lend themselves to macroanalysis using the data sources available and many of the established money laundering indicators for residential property did not apply to commercial property.¹⁹⁰

¹⁸⁷ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at p. 70.

¹⁸⁸ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at p. 70.

¹⁸⁹ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at p. 71.

¹⁹⁰ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at p. 71.

The results for the combined property dataset were as follows:

1. ownership (percentages of properties):
 - a. ownership by a legal entity or arrangement: 7%;
 - b. ownership by a nominee: 3%;
 - c. ownership by an overseas buyer: 1.06%;
 - d. ownership by a buyer from a high-risk jurisdiction: 0.24%;
 - e. title holder uses an opaque address: 5.66%;
2. financing:
 - a. purchase does not involve external financing: 17-21% of titles;
 - b. mortgage with an unregulated lender: 9% of mortgages;
 - c. mortgage from overseas lenders: 24 mortgages;
 - d. mortgage discharged quickly: 5% of mortgages;
 - e. multiple mortgages registered and discharged quickly:
 - i. 8% (two mortgages), 1% (three mortgages) and 1% (four or more mortgages);
 - ii. 0.79% of properties had multiple mortgages discharged between 30 and 365 days;
 - f. mortgage with an unusual loan-to-value (LTV) ratio: 15% of all mortgages (regulated and unregulated) had a LTV above 100% and 27% of unregulated mortgages had a LTV below 30%;
3. valuations: property is overvalued or undervalued: 3% of titles;

4. transactions:

- a. property flipped multiple times: 0.76% of titles; and
- b. buyer has acquired multiple properties in a brief period: <0.3%.¹⁹¹

111. To test the validity of their indicators, the German Report 2 compiled a list of 154 properties with known or strongly suspected links to money laundering and assessed the prevalence of each indicator in the sample relative to the larger datasets.¹⁹² The results for the sample of 154 titles were as follows:

1. ownership (percentages of properties):

- a. ownership by a legal entity or arrangement: 12%;
- b. ownership by a nominee: 5% of titles;
- c. ownership by an overseas buyer: 2.6%;
- d. ownership by a buyer from a high-risk jurisdiction: 1.3%
- e. title holder uses an opaque address: 3.9%;

2. financing:

- a. purchase does not involve external financing: 8-16% of titles;
- b. mortgage with an unregulated lender: 34% of mortgaged properties and 24% of mortgages;
- c. mortgage from overseas lenders: 0;
- d. mortgage discharged quickly: 8%;

¹⁹¹ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at pp. 73-107.

¹⁹² P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at pp. 107-112.

- e. multiple mortgages registered and discharged: few;
 - f. mortgage with an unusual loan-to-value (LTV) ratio: not reviewed;
3. valuations: property is overvalued or undervalued: 1%, but indicator could not be analysed across the whole sample;
4. transactions:
- a. property flipped multiple times: 5.19% of titles; and
 - b. buyer has acquired multiple properties in a brief period: less than 4.5%.¹⁹³

112. Finally, the German Report 2 used the 154 titles on its suspicious properties list to explore whether a scoring system could be an effective way to flag money laundering risk for specific properties.¹⁹⁴ Each property was assessed a point for every indicator that applied. The indicators were first repackaged as: (1) opaque owner (legal entity, legal arrangement or nominee); (2) opaque address (service address is overseas, a post office box or a law office); (3) unfinanced purchase; (4) quickly discharged mortgage (single or multiple); (5) mortgage with unregulated or overseas lender; (6) property is overvalued or undervalued property has been flipped; and (7) property was part of a buying spree. Sixty-one percent of the 154 properties received one or more points for the seven repackaged indicators. One property received three points; 37 properties received two points; and 54 properties received one point. The most common indicators were opaque ownership structures and mortgages with unregulated lenders, which accounted for 14% and 24% of the sample, respectively. These indicators appeared together for 7% of properties.

¹⁹³ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at pp. 73-107.

¹⁹⁴ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at pp. 111-112.

113. Based on the above, the German Report 2 concluded that a scoring system may not be an effective way to detect properties linked to money laundering.¹⁹⁵ However, the evaluation of the indicators against the 154 properties gave some insight into their validity. The only indicator significantly higher for the suspicious properties dataset was borrowing from unregulated lenders.

114. The LTSA provided a custom dataset with information from Claim of Builders lien forms submitted electronically.¹⁹⁶ A cursory review indicated that of almost 11,000 claims, about 1,660 were submitted by unique claimants, most through a lawyer or notary. Eighty-five claimants were individuals and 23 were numbered companies without a “doing business as” addendum. The dollar amounts claimed were mostly for smaller sums than identified in a *Globe and Mail* investigation about money laundering through builders liens. Most of the descriptions of the claims had detailed summaries of the work allegedly done. The German Report 2 concluded there was no indication of widespread misuse of builder’s liens for money laundering.

Export of luxury vehicles

115. The German Report 2 said the number of applications for refunds of provincial sales tax (“**PST**”) on vehicles is a strong indication of the size of the grey market for exported vehicles from the province.¹⁹⁷ Prior to 2014, the number of applications was less than 100 per year, but in each of 2014 and 2015 it was more than 700 and then went up to 3,674 in 2016. The number of applications grew further to 4,452 in 2018. Ministry of Finance staff raised concerns about several red flags for possible money laundering activity, including:

1. vehicle registration documents that appeared to have been altered;

¹⁹⁵ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at p. 112.

¹⁹⁶ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at p. 115

¹⁹⁷ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at p. 198.

2. high value cars;
3. generic-looking expert documents with suspicious inconsistencies;
4. straw buyers struggling to explain anomalies in documents;
5. the same straw buyers in multiple transactions;
6. PST refunds directed to vehicle exporters rather than purchasers;
7. straw buyers often did not speak English and were “clearly just a signature”;
8. method of purchase of vehicles (e.g. bank drafts or physical cash);
9. value of PST refunds; and
10. total purchase value for all refunds.¹⁹⁸

116. Ministry staff gathered statistics for the German Report 2 for 2016/2017 on the number of unique straw buyers, the number of transactions per straw buyer, which exporters straw buyers were linked to and the identification provided by the straw buyer (e.g. foreign national passport or British Columbia driver’s license). Based on these statistics, the German Report 2 did not estimate the extent of money laundering in the luxury vehicle export grey market, but the report concluded there was a money laundering risk.

Independent luxury car resellers

117. The German Report 2 cross-referenced publicly available information and found a number of luxury car resellers operated by individuals with serious criminal histories,

¹⁹⁸ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at pp. 199-200.

typically for drug trafficking.¹⁹⁹ This was the extent of the estimate of the risk for this sector.

Horse racing

118. The German Report 2 explored the vulnerability of the horse racing industry to money laundering by looking at: (1) police and provincial Gaming Policy and Enforcement Branch (“**GPEB**”) information and investigations; (2) demographics of wagerers; (3) size of wagers; (4) sales of race horses, including a cursory examination of who buyers and sellers were; (5) use of self-serve terminals to wager; and (6) online betting.²⁰⁰

119. The Vancouver Police Department compiled a 10-year dataset (July 2008 to November 2018) for the German Report 2 of police-reported incidents at Hastings Racecourse.²⁰¹ There were 61 files: 3 fraud, 3 counterfeiting currency and the rest were minor incidents or petty crimes such as assault, mischief, theft and public intoxication.

120. The RCMP provided a detailed analysis of all incidents / files associated with horse racing in the province for 2009 to 2019.²⁰² There were 110 files. Seventeen were determined as potentially relevant to money laundering, loan sharking or other incidents that might be associated with organised crime or criminal activities. However, in every case, the incidents of concern were associated with the onsite casino at the horse racing venue and not with wagering on the horses.

121. GPEB and Joint Illegal Gaming Investigation Team staff were interviewed and said they had never received any information or complaint about money laundering or

¹⁹⁹ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at p. 206.

²⁰⁰ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at p. 235.

²⁰¹ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at p. 237.

²⁰² P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at p. 237.

suspicious financial transactions at a race track.²⁰³ These staff also noted that the average financial transaction was small. Other indicators also led the German Report 2 to conclude there was unlikely to be much risk of money laundering in the horse racing sector.²⁰⁴

N. RCMP 2017 and 2018 investigations

122. In November 2017, the RCMP tried to estimate Vancouver-area property transactions linked to criminality.²⁰⁵ The RCMP study used data from the Real Estate Board of Greater Vancouver listing residential properties bought in 2015 and 2016 and valued at a threshold exceeding \$3 million. The property addresses were reviewed in the BC Online Land Titles database to identify property owners. Owner names were then checked against the PRIME-BC database to determine potential criminality / criminal involvement. The initial findings indicated about 10% of property purchasers in 2015 and 2016 were linked to some level of criminality, including suspicious currency transactions, drug importation / production / trafficking, gaming intelligence, fraud, extortion and proceeds of crime. No cross-referencing or validation against historical or current investigations, intelligence or other opened or closed data sources was done.

123. In 2018, the RCMP E Division Federal and Serious Organized Crime Project E-Pirate produced a draft report estimating the value of transactions facilitated by one unlicensed money services business.²⁰⁶ The data came from seizure and or judicial authorisations of electronic and handwritten corporate financial ledgers, domestic bank accounts and images from several electronic devices. The yearly value of transactions flowing through the business approached \$1 billion, but the RCMP said the study was caveated with methodological limitations in terms of information gaps and overlaps.

²⁰³ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at p. 238.

²⁰⁴ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at pp. 238-243.

²⁰⁵ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at p. 334 (Appendix G).

²⁰⁶ P. German, *Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing*, March 31, 2019 at p. 335 (Appendix H).

O. Conclusion

124. As described above in this Overview Report, there have been a number of attempts to quantify money laundering in different jurisdictions, globally and/or in various industries / sectors, including:

1. the unverifiable International Monetary Fund “consensus” range of 2-5% of global GDP;
2. extrapolations from capital mobility data and discrepancies;
3. extrapolations from measurements of the shadow or underground economy, including:
 - a. Currency Demand approach;
 - b. discrepancy between indicators of overall economic activity and official GDP;
 - c. Dynamic / Multiple-Indicators Multiple Causes approach;
 - d. Two Sector / General Equilibrium model;
4. extrapolations from suspicious transaction reports or other indicators of potential money laundering;
5. extrapolations from proceeds of crime data, including:
 - a. case studies; and
 - b. Walker Gravity model.²⁰⁷

125. All of these methods derive estimates based on proxies measurements because measurement of actual amounts laundered is likely impossible given that, by definition,

²⁰⁷ Appendix A has a table listing the above categories, other categorisations and the primary people or agencies associated with each method.

money laundering is an attempt to legitimise the proceeds of illegal activities. No one of the approaches described in this Overview Report has attracted academic consensus that it is the best way to quantify money laundering. Each method has proponents and each has been criticised for various weaknesses.

126. Nevertheless, the Commission's Terms of Reference require inquiry into the extent and growth of money laundering in British Columbia in certain sectors and estimates may at least provide minimum bounds and/or a sense of the order of magnitude of the problem in our province, which might, in turn, inform public policy decisions.

P. Appendix A: Summary of quantification methods

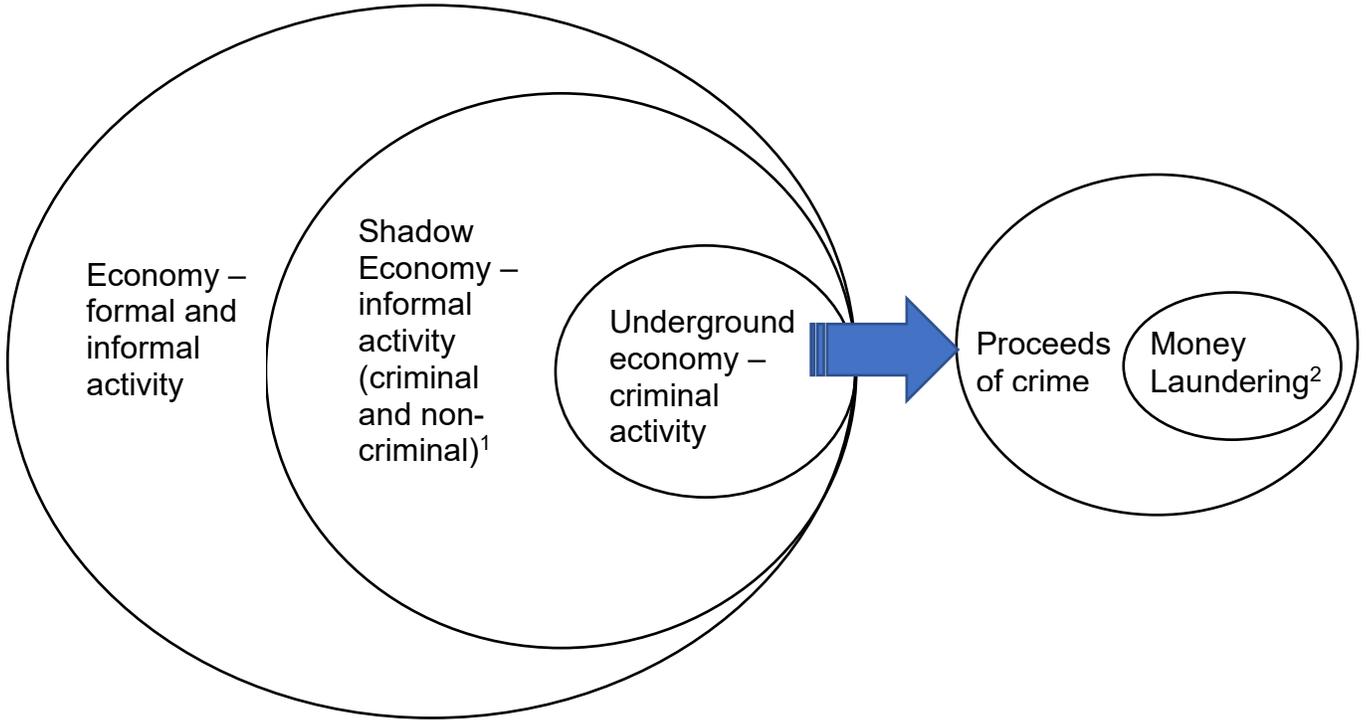
Memo category	Macro/microeconomic	Direct/indirect	Top down/bottom up	Primary people or agency associated with the method
<i>Unverifiable International Monetary Fund “consensus” range of 2-5% of global GDP</i>	Unknown	Unknown	Unknown	International Monetary Fund
<i>Capital mobility data and discrepancies</i> <ul style="list-style-type: none"> - <i>Hot Money</i> - <i>Residual</i> - <i>Dooley</i> - <i>Trade Mispricing</i> 	Macroeconomic	Indirect	Top down	Global Financial Integrity (D. Kar and D. Cartwright-Smith)

Memo category	Macro/microeconomic	Direct/indirect	Top down/bottom up	Primary people or agency associated with the method
- <i>Global Financial Integrity</i>				
<i>Extrapolations from estimates of the shadow or underground economy</i>				
Currency Demand approach	Macroeconomic	Indirect	Top down	V. Tanzi G. Ardizzi, C. Petraglia, M. Piacenza, F. Schneider and G. Turati, "Money Laundering as a Crime in the Financial Sector: A New Approach to Quantitative Assessment, with an Application to Italy", (2014) 46 Journal of Money, Credit and Banking 1555
Discrepancy between indicators of overall economic activity and official GDP	Macroeconomic	Indirect	Top down	Kaufmann, D. and A. Kaliberda, "Integrating the unofficial economy into the dynamics of the post socialist economies: a framework of analyses and evidence", in <i>Economic Transition in Russia and the New States of Eurasia</i> , B. Kaminski and M. E. Sharpe, eds. (London, 1996)

Memo category	Macro/microeconomic	Direct/indirect	Top down/bottom up	Primary people or agency associated with the method
Dynamic / Multiple-Indicators Multiple Causes approach	Some commentators say macroeconomic, some say microeconomic	Indirect	Top down	Friedrich Schneider
Two Sector / General Equilibrium model	Some commentators say macroeconomic, some say microeconomic	Indirect	Top down	A. Argentiero, M. Bagella and F. Busato, “Money laundering in a two-sector model: using theory for measurement”, (2008) 26 Eur J Law Econ 341
<i>Extrapolations from suspicious transaction reports or other indicators of potential money laundering;</i>	N/A	Indirect	Bottom up	<p>M. Levi and M Gold, Money Laundering in the United Kingdom: An Appraisal of Suspicious-Base Reporting (London: Police Foundation, 1994)</p> <p>J. Zdanowicz, “Trade-Based Money Laundering and Terrorist Financing”, (2009) 5 Review of Law and Economics 855</p> <p><u>In BC:</u></p>

Memo category	Macro/microeconomic	Direct/indirect	Top down/bottom up	Primary people or agency associated with the method
				<p>M. Maloney, T. Somerville and B. Unger, <i>Combatting Money Laundering in BC Real Estate, Expert Panel on Money Laundering in BC Real Estate</i>, 2019</p> <p>P. German & Associates Inc., <i>Dirty Money – Part 2: Turning the Tide – An Independent Review of Money Laundering in B.C. Real Estate, Luxury Vehicle Sales & Horse Racing</i>, March 31, 2019</p>
<i>Extrapolations from proceeds of crime data</i>				
Case studies	N/A	Direct	Bottom up	Stephen Schneider and Margaret Beare
Walker Gravity model	Microeconomic	Indirect and direct	Bottom up	John Walker B. Unger and colleagues at Utrecht University Joras Ferwerda

Q. Appendix B: Money Laundering and Related Terms



¹ The terms “*shadow economy*” and “*underground economy*” are sometimes used interchangeably.

² Money laundering - The United Nations defines it as “*any act or attempted act to disguise the source of money or assets derived from criminal activity.*” It is where proceeds of crime are transformed into “*clean money*,” the criminal origin of which is difficult to trace.

