Technical Annex to the *Economic Note*
"Cutting Public Spending Promotes Economic Growth"
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1. The marginal cost of taxes

Estimates of the cost of raising an additional dollar range from $1.10 according to Robert J. Barro and Charles J. Redlick,[1] to $2.50 according to James Cloyne,[2] to $3.00 according to Christina D. Romer and David H. Romer,[3] to between $1.20 and $4.30 according to Paul M. Jones and Eric Olson depending on monetary policy,[4] and to $5.00 according to Andrew Mountford and Harald Uhlig.[5]

In a recent study, Karel Mertens and Morten O. Ravn[6] review this literature in order to attempt to determine why these estimates diverge so widely. They conclude in favour of the higher results, and rule out the lower results of Oliver Blanchard and Roberto Perotti[7] that go from $0.45 to $1.45 depending on the hypotheses used and the periods examined, as well as the $0.50 estimate of Carlo Favero and Francesco Giavazzi,[8] since overdetermined by their model.

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[1] Robert J. Barro and Charles J. Redlick, "Macroeconomic Effects from Government Purchases and Taxes," *Quarterly Journal of Economics*, Vol. 126, No. 1, 2011, pp. 51-102.

[2] James Cloyne, "Discretionary Tax Changes and the Macroeconomy: New Narrative Evidence from the United Kingdom," *American Economic Review*, Vol. 103, No. 4, 2013, pp. 1507-1528.

[3] Christina D. Romer and David H. Romer, "The Macroeconomic Effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks," *American Economic Review*, Vol. 100, No. 3, 2010, pp. 763-801.

[4] Paul M. Jones and Eric Olson, "Tax Multipliers and Monetary Policy: Evidence from a Threshold Model," *Economics Letters*, Vol. 122, No. 2, 2014, pp. 116-118.

[5] Andrew Mountford and Harald Uhlig, "What Are the Effects of Fiscal Policy Shocks?" *Journal of Applied Econometrics*, Vol. 24, No. 6, 2009, pp. 960-992

[6] Karel Mertens and Morten O. Ravn, "A Reconciliation of SVAR and Narrative Estimates of Tax Multipliers," *Journal of Monetary Economics*, Vol. 68, December 2014, pp. S1- S19.

[7] Oliver Blanchard and Roberto Perotti, "An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output," *Quarterly Journal of Economics*, Vol. 117, No. 4, 2002, pp. 1329-1368.

[8] Carlo Favero and Francesco Giavazzi, "Measuring Tax Multipliers: The Narrative Method in Fiscal VARs," *American Economic Journal: Economic Policy*, Vol. 4, No. 2, 2012, pp. 69-94.

2. Comparisons of OECD countries according to their budgetary policies

The *Economic Note* focuses on the OECD countries, and the numbers cited come from the authors' calculations based on the quarterly GDP indicators and tax data series compiled by the OECD, as well as Eurostat for Iceland and Slovenia. We exclude Chile and Turkey because of the unavailability of certain data. Norway and Switzerland are also excluded because these two countries had budget surpluses at the beginning of the period studied.

Table A-1 presents the data used to construct Figure 1 and Table 1 in the *Note*. It also includes the alternative method of analysis based on the 75% efforts discussed in the *Note*. The similarity of the results obtained using the two methods attests to the robustness of the analysis.

Table A-1
Comparison of countries according to budgetary policies

Country group		Deficit relative to GDP in 2009	Variation in the deficit relative to GDP (percentage points), end of 2013	Variation in spending relative to GDP (percentage points), 2009-2013	Variation in revenues relative to GDP (percentage points), 2009-2013	Average annual GDP growth, 2009-2013	Number of countries
Among countries having increased their revenues	Countries that reduced their spending	7,4 %	-4,3	-2,5	+1,8	+0,8 %	17[i]
	Countries that increased their spending (including Greece)	6,1 %	-0,4	+2,9	+3,3	-0,3 %	8[ii]
	Countries that increased their spending (excluding Greece)	4,8 %	0,0	+2,5	+2,5	+0,4 %	7
Countries having reduced their revenues and their spending		2,1 %	-2,0	-3,7	-1,8	+2,4 %	4[iii]
75% of efforts coming from spending cuts		5,0 %	-2,1	-1,9	+0,2	+1,3 %	12[iv]
75% of efforts coming from tax increases		6,9 %	-2,3	+1,1	+3,5	-0,4 %	8[v]

[i] Australie, Autriche, République tchèque, Allemagne, Hongrie, Islande, Irlande, Israël, Italie, Pays-Bas, Nouvelle-Zélande, Pologne, Portugal, Slovaquie, Espagne, Royaume-Uni et États-Unis.
[ii] Belgique, Danemark, Finlande, France, Slovénie, Japon, Mexique et Grèce.
[iii] Canada, Estonie, Corée du Sud et Luxembourg.
[iv] Autriche, Canada, Estonie, Finlande, Allemagne, Irlande, Corée du Sud, Luxembourg, Nouvelle-Zélande, Pologne, Slovénie et Royaume-Uni.
[v] Belgique, Danemark, France, Grèce, Italie, Japon, Mexique et Portugal.

Sources: OECD, Statistical database, Quarterly National Accounts, Quarterly Growth Rates of real GDP, change over previous quarter, expenditure approach, 2009-2013; OECD, Statistical database, Annual National Accounts, Government deficit/surplus, revenue, expenditure and main aggregates, 2009-2013; OECD, Statistical database, Annual National Accounts, Gross domestic product (GDP) (expenditure approach in current dollars), 2009-2013; Eurostat, Statistical database, Government revenue, expenditure and main aggregates, 2009-2013; Eurostat, Statistical database, GDP and main components (output, expenditure and income), 2009-2013.

3. Sources for data on Quebec and Canada

Quebec Finance Department, *2015-2016 Budget: The Quebec Economic Plan*, March 2015, p. 4; Quebec Finance Department, *2014-2015 Budget: Budget Plan*, June 2014, p. I.19 and I.20; Quebec Finance Department, *2013-2014 Public Accounts: Consolidated Financial Statements of the Gouvernement du Québec*, Volume 1, November 2014, p. 23; Institut de la statistique du Québec, Produit intérieur brut selon les dépenses, données désaisonnalisées au taux annuel, base 2007, fichier Excel (1981-2015); Statistics Canada, CANSIM Table 384-0038: Gross domestic product, expenditure-based, provincial and territorial, 2009-2013; Statistics Canada, CANSIM Tableau 380-0064: Gross domestic product, expenditure-based, quarterly, 2009-2013.