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Fiscal Policy and US-Canadian Trade

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Abstract

A factor-augmented vector autoregressive (FAVAR) model is applied to determine the effects of a rise in US government expenditure on the United States and Canadian economies. The results obtained reasonably characterize the effect of a rise in US government spending to the United States and Canadian economies emphasizing the role of the traded goods sector.

1. INTRODUCTION

What are the dynamic effects of US government expenditure movements both on the US and Canada economies? This question is answered by applying factor-augmented VAR methodology – based on the Stock and Watson (1998; 2002) two-step principal component approach[1] of Bernanke, Boivin and Eliasz (2005) and Stock and Watson (2005) to a large data set which takes into account the traded goods sector, where exports and imports are disaggregated into 12 and 13 industries, respectively[2].

The great appeal of using FAVAR models to study fiscal and monetary policy transmission mechanisms is that they can, in line with the current practice of policy makers, who tend to monitor a large number of economic time series before taking monetary and fiscal decision, potentially employ thousands of data series in the model.

Employing FAVAR models has at least two advantages over traditional VARs[3].First, the fact that the VAR information set is likely to be smaller than that used by policy-makers may imply that the VAR model is miss-specified. If the model suffers from omitted variable bias it implies that policy shocks cannot be fully recovered from VAR innovations and so may produce erroneous results. The "price puzzle" discovered by Sims (1992) is only one example of the serious consequences of a miss-specified VAR model [4] Second, impulse responses can only be routinely generated for the variables included in the model, and constitute only a subset of the variables of interest to economists and policy-makers [5]

Principal components analysis is used to calculate the factors that summarise the most relevant information contained in the series. It should be stressed that the number of factors will be much smaller than the number of variables in the data set. As a result, the amount of information, which can be handled by the model, increases dramatically and hence the chance of under-specifying the econometric model used to assess the effect of a rise in government spending is significantly reduced. Results indicate that the factor-augmented VAR model generates a reasonable characterization of United States government expenditure movements and the channels through which this effect the Canadian economy.

This note is organized as follows. Section 2 describes the statistical model. Section 3 applies the methodology to the US and Canadian data. Section 4 provides a brief conclusion.

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1. Factor models have been applied to both non-stationary (Pesaran and Smith, 2006; Dees, Di Mauro, Pesaran and Smith, 2007; Lagana, 2009) and stationary variables (Bernanke, Boivin and Eliasz, 2005; Lagana and Mountford, 2005; Lagana and Sgro, 2011; Stock and Watson, 2005).

2. Few papers have investigated international trade spill-overs from fiscal policy shocks (e.g. Beetsma, Giuliodori and Klaassen, 2008), but none of these studies have had access to disaggregated trade data on the main imports into Canada from the United States and the main exports from Canada to the United States that is used in the present paper.

3. These models were first introduced by Christopher Sims in 1980 (Sims, 1980).

4. Sims (1992) was the first to note the conventional finding in the VAR literature, that a monetary policy contraction produces a slight increase rather than a decrease in inflation and might be due to the imperfectly controlling information the central bank may have about future inflation.

5.Due to the high degree of freedom costs in the estimation, VARs typically include fewer than 10 variables. Exceptions are the Bayesian VAR models, which can include up to 20 variables (e.g., Leeper, Sims and Zha, 1996).

2. THE THEORY

As in Stock and Watson (2005) the VAR form of the dynamic factor model – that can be estimated using their two step-principal component approach - can be written as:

$$\begin{bmatrix} F_t \\ X_t \end{bmatrix} = \begin{bmatrix} \Phi(L) & 0 \\ \Lambda\Phi(L) & D(L) \end{bmatrix} \begin{bmatrix} F_{t-1} \\ X_{t-1} \end{bmatrix} + \varepsilon_t \tag{1}$$

where X_t denote a large (n × 1) information matrix that contain hundreds of stationary economic time series; F_t a (n × 1) vector of unobservable factors which can summarise most of the information contained in X_t. Λ a (n × r) matrix, with the coefficients of λ_i (L) on the ith row, $\Phi(L)$ a diagonal lag polynomial matrix made of the Γ_t coefficients. The error term is defined as follows:

$$\varepsilon_t = \begin{bmatrix} I \\ \Lambda \end{bmatrix} G\eta_t + \begin{bmatrix} 0 \\ \nu_t \end{bmatrix}$$

The crucial point of this factor-augmented VAR model (1) is that the amount of information that can be handled by the model changes dramatically (r << n).

The Government spending shock is recovered using the Cholesky identification scheme and like Bernanke, Boivin and Eliasz (2005) is assumed that the X_t matrix can be partitioned into three blocks, a slow-series, the shock and a fast-moving series. The slow-moving variables are those predetermined as of the current period, such as real variables, whereas the fast-moving variables are those highly sensitive to contemporaneous economic news or shocks, such as prices and financial assets. The slow series shocks can affect all variables, a shock from government spending can affect only itself and the fast variables, shocks in the fast-variables can only affect fast variables.

3. AN APPLICATION TO THE US AND CANADA

This section reports the results of the statistical model presented in section 2. A factor augmented VAR, model with 4 lags is estimated.

The data set used to estimate the factors is a balanced panel that contains 135 quarterly time series for the United States and Canada from 1982(1) to 2004(4). These series were chosen from 11 categories: employment; Government finance; output; housing starts and vehicles; consumer and retail confidence; prices; money and loans; interest rates; composite leading indicators and stock prices and exchange rates. The authors obtained an additional category, the main imports into Canada from the United States, and the main exports out of Canada to the United States from Canada Statistics. The sample size

was determined by the trade data which was only available for the period 1982-2004. As a measure of shock we used a 1 standard deviation increase in government expenditure.

The theory outlined in section 2 assumes that X_t is a matrix of I (0) underlying macroeconomic variables, so these series were first subjected to the following possible transformation: logarithmic, differencing, seasonal adjustment and screening for outliers. The decision to take logarithms or to first difference of the series was based on data inspection and formal unit root tests. All series were standardised to have sample mean zero and unit variance. The appendix describes for each serie the transformation code; whether a variable is considered slow or fast moving and the fraction of variance explained by each estimated factor at the 8-th quarter ahead.Outlier-adjusted series were employed to estimate the number of static and dynamic factors. Outlier-unadjusted series were used for all remaining estimates.
Information criteria tests indicated the presence of 4 dynamic factors among all variables and 2 among the slow variables.

3.1 Impulse response functions

The results in Table 1 generally accord with the standard IS-LM theory. A shock from and increase in government spending in the United States that initially increases by 1% is estimated to keep increasing up to 0.9% after three years. The impact of this shock on both the United States and Canada is captured in Table 1 and is discussed below.

 In the United States, the unemployment rate decreases by 1.3% after one year, 3.4% after two years and 4.4% after three years, relative to the no-shock benchmark. Thus the positive impact on employment increases over time.   Output also contracts, with Industrial production durable goods increasing by 18.8% after two quarters, 12.1% after one year and 9.5% after three years. The expansion is felt more strongly in the investment and durable goods-producing sectors, than in consumer goods. Inflation initially contracts slightly, with CPI inflation falling by 0.1% after two quarters but increasing by 0.2% after two years and 0.3% after 3 years.   CPI energy falls by 0.3% after two quarters and then increases substantially over the remainder of the period By 2.6% after two years and 2.8% fatre trhree years. The interest rate contracts with the federal fund rate falling by 0.1% after one year and then rises slightly after two years(0.1%). The 10-year yield on government securities increases by 0.5% after years one and two and then by 0.4% by year three.

The stock market enters a pronounced decline in response to the expansion, with the NYSE share price index loosing 10.5% of its value within a year; 13.1% after two years and 13.4% after three years . The nominal effective trade weighted exchange rate appreciates by 2.2% within a year, 3.4% after two years and 3.8% after year three.

Turning now to Canada, the unemployment rate falls by 3.5% after one year, 4.2% fater years two and   three, relative to the no-shock benchmark. Output expands, with Industrial Production increasing by 2.7% after one year, 2.9% after two years and 2.8% after year threee. The expansion is felt more strongly in the industrial production than in the service sector. While CPI energy increased by 1.6% after one year, 2.7% after two and 2.6% after three years, other inflation measures fell. The CPI, for example, falls by 1.2%, 1.4% and 1.5 after years one,two and three respectively.

The 10-year yield on government securities increased by 0.4% after years one, two and

three, while the money market rate fell by 0.6% after one year 0.4% after two and 0.5% after three years. The stock market enters a pronounced decline in response to the expansion in industrial production and employment with the TSE 300 share price index loosing 4.1% of its value within a year, 4.4% after two and 5.0% after three years. The Canadian dollar appreciates against the United States dollar by 4.6% after a year, 4.9% after two and 5.0% after three years.

Concerning international trade variables in Table 1 the major exports from the US to Canada are motor vehicles and spare parts, industrial and electrical machinery plastics, computers chemicals and petroleum products and natural gas and agricultural products. In 2007, this made up 65% of Canada's total imports. The major exports from Canada to the US are motor vehicles and spare parts, crude petroleum and natural gas, forest products, agricultural products, metals, industrial machinery and aircraft. In 2007, this made up 76% of all Canada's total exports. Given this reliance by Canada on the US economy, it is not surprising that the transmission channel is strong.

As a result of the government spending shock the 9 major Canadian product categories imported from the United States all increased, after 4 quarters, accept for electronic tubes and othe telecommunications which decreased by 1.0%. and 3.5 % respectively after one year and 0.3% and 2.1% after three years respectively. The largest increase ,after one year, was in "motor vehicle parts except engines" , 4.3%, (and 4.6% after three years) which was followed by "trucks and truck tractors which increased by 3.8% (and 4.2% after three years).
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 The behaviour of exports from Canada to the United States as a result of the same government spending shock in the United States are mixed. Of the 13 product categories exported to the United States from Canada, 9 increased while 3 fell. The product category "passenger automobiles "rose by 2.7% after ine year and 3.4% after three years while "crude petroleum" rose by 3.4% after one year and 4.4% after three years. The largest increase in exports was in the product categories "motor vehicle engines and parts" at 6.3% after one year and 6.5% after three years and natural gas by 5.8% after on year and 7.0% after three years. Theory predicts that exports from Canada to the United States should rise as a result of the appreciation of the United States/Canada exchange rate. These results which generally support the "transmission of shocks or pass-through across countries through trade" are in line with standard theory given the proximity and trade relations of both economies.

<div align="center">3.2 Variance Decomposition</div>

Concerning the variance decomposition, in Table 2 for the United States, the estimates of the variance in variables explained by the government spending shock appear to be large for the majority of the real variables and small for prices. For example the shock only explains 21.2% of industrial production investment goods (including defence) in the 12th quarter and 23.9% of industrial production durable goods in the 12th quarter, while it explains only 0.3% of CPI inflation in the 12th quarter and only 0.7% of CPI energy in the 12th quarter. On the other hand, the fraction of the variance explained by the spending shock is estimated to be large for United States share price index, 13.2% in the 12th quarter and 10.2% for 10-year yield on United States government securities in the 12th quarter.

For Canada, from the estimated fraction of the variance decomposition explained by the government spending shock appears to be relatively large ranging from 10.8% for "industrial production excluding construction" to 16.8% for industrial production manufacturing" in the 12th quarter. For energy prices, it explains only 2% of its variance and 8.5%of the CPI all items in the 12th quarter. The fraction of the variance explained by the government expenditure shock is estimated to be small for share price index, 2.7%in the 12th quarter while high for the real effective exchange rate index 23.8% in the 12th quarter.

For the trade variables, Table 2, in the case of imports, for "motor vehicle parts except engines", 7.2%in the 12th quarter, while for "electronic computers 0.6% in the 12th quarter while for the case of exports, for wood pulp and similar pulp the variance was 9.1% in the 12th quarter, while for newsprint paper it was 14.3% in the 12th quarter.

4. CONCLUSIONS

This note investigate how innovations in government spending originating in the United States affects the United States economy and how these effects are transmitted to the Canadian economy using the factor-augmented VAR (FAVAR) approach of Stock and Watson (2005) and Bernanke, Boivin and Eliasz (2005). This model offers a possible solution to the limited information problem that affects VARs, and allows impulse response functions to be generated for all the variables in the dataset and so is able to provide a comprehensive description of the domestic and international transmission mechanism of changes in United States government spending shocks to the Canadian economy.
The results obtained reasonably characterize the effect of a US government spending movement to the United States and Canadian economies emphasizing the role of the traded goods sector.

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Table I
IMPULSE RESPONSE FUNCTIONS - REAL AND MONETARY VARIABLES

Variable	Impulse Response to Government Expenditure Shock at quarter				
	0	2	4	8	12
GOVERNMENT EXPENDITURE	**1.0**	**0.7**	**1.0**	**0.9**	**0.9**
United States					
US UNEMPLOYMENT RATE	2.5	-2.1	-1.3	-3.4	-4.4
US INDUSTRIAL PRODUCTION - CONSUMER GOODS	-0.3	0.7	1.0	0.9	0.9
US INDUSTRIAL PRODUCTION - CONSTRUCTION MATERIALS	0.5	2.8	3.9	4.3	4.3
US INDUSTRIAL PRODUCTION - DURABLE GOODS	-0.6	18.8	12.1	9.1	9.5
US INDUSTRIAL PRODUCTION - INVESTMENT GOODS (INCL. DEFENCE)	2.3	15.6	17.3	15.1	15.2
US CPI	0.0	-0.1	0.0	0.2	0.3
US CPI ENERGY	0.2	-0.3	1.3	2.6	2.8
US FEDERAL FUNDS RATE	-0.5	-0.4	-0.1	0.1	0.0
US YIELD 10 - YEAR FEDERAL GOVERNMENT SECURITIES (COMPOSITE)	0.1	0.4	0.5	0.5	0.4
US SHARE PRICE INDEX - NYSE COMMON STOCKS	-3.7	-6.5	-10.5	-13.1	-13.4
US REAL EFFECTIVE EXCH.RATE INDEX - NORMALIZED LABOR COST BASED	1.2	1.8	2.2	3.4	3.8
Canada					
CN STANDARDIZED UNEMPLOYMENT RATE	1.3	-1.7	-3.5	-4.2	-4.2
CN INDUSTRIAL PRODUCTION - INDUSTRY EXCLUDING CONSTRUCTION	-0.6	1.1	2.2	2.5	2.5
CN INDUSTRIAL PRODUCTION - MANUFACTURING	-0.5	2.2	3.7	4.5	4.7
CN INDUSTRIAL PRODUCTION - CONSUMER NON	-0.2	1.3	2.3	2.4	2.3
CN INDUSTRIAL PRODUCTION	-0.1	1.6	2.7	2.9	2.8
CN CPI	-0.3	-1.0	-1.2	-1.4	-1.5
CN CPI ENERGY	0.4	0.1	1.6	2.7	2.6
CN MONEY MARKET RATE (FEDERAL FUNDS)	-1.0	-0.9	-0.6	-0.4	-0.5
CN YIELD 10 - YEAR FEDERAL GOVERNMENT BENCHMARK BONDS	0.0	0.2	0.4	0.4	0.4
CN SHARE PRICES - TSE 300 COMPOSITE	-2.7	-3.1	-4.1	-4.4	-4.0
CN CAD/USD EXCHANGE RATE INDEX	2.2	3.1	4.6	4.9	5.0
CN REAL EFFECTIVE EXCHANGE RATE INDEX - CPI BASED	-2.0	-3.5	-4.5	-4.2	-4.2
CN TRADE VARIABLES					
Import					
MOTOR VEHICLE PARTS, EXCEPT ENGINES	-1.0	6.1	4.3	4.3	4.6
PASSENGER AUTOMOBILES AND CHASSIS	-2.1	6.4	0.8	0.7	1.3
ELECTRONIC COMPUTERS	-2.5	0.2	0.3	1.6	1.7
TRUCKS, TRUCK TRACTORS AND CHASSIS	-2.7	6.1	3.8	3.9	4.2
ELECTRONIC TUBES & SEMI-CONDUCTORS	-8.1	-4.8	-1.0	0.2	-0.3
OTHER TELECOMMUNICATION & REL. EQUIP.	-6.0	-5.5	-3.5	-1.9	-2.1
MOTOR VEHICLE ENGINES	-2.8	2.8	1.8	2.5	2.8
ORGANIC CHEMICALS	-2.5	1.5	0.8	1.2	1.3
SPECIAL TRANSACTIONS TRADE	2.5	0.5	1.4	1.3	1.2
OTHER CHEMICAL PRODUCTS	-1.7	0.4	0.3	0.4	0.4
MISCELLANEOUS EQUIPMENT AND TOOLS	1.1	2.5	3.1	3.1	3.1
PLASTICS MATERIALS, NOT SHAPED	-3.2	2.4	1.4	2.0	2.1
Export					
PASSENGER AUTOMOBILES AND CHASSIS	-3.7	4.5	2.7	3.0	3.4
NATURAL GAS	3.2	-1.2	5.8	7.6	7.0
CRUDE PETROLEUM	3.1	-1.5	3.4	5.2	4.4
MOTOR VEHICLE ENGINES AND PARTS	-1.1	9.4	6.3	6.0	6.5
MOTOR VEHICLE PARTS, EXCEPT ENGINES	0.5	6.5	5.5	5.3	5.5
TRUCKS, TRUCK TRACTORS AND CHASSIS	1.7	-0.2	0.4	0.3	0.2
PETROLEUM AND COAL PRODUCTS	1.3	-1.8	-1.3	-2.3	-2.4
NEWSPRINT PAPER	2.2	2.7	2.4	2.2	2.2
LUMBER, SOFTWOOD	-0.9	-1.6	-1.9	-1.5	-1.5
WOOD PULP AND SIMILAR PULP	3.3	3.4	2.2	2.0	2.1
ALUMINUM, INCLUDING ALLOYS	1.8	0.8	0.5	0.3	0.3
OTHER TELECOMMUNICATION & REL. EQUIP.	-0.2	-0.1	-0.6	-1.3	-1.2
OFFICE MACHINES AND EQUIPMENT	0.5	-0.2	-0.7	-1.0	-1.0

Table II.
VARIANCE DECOMPOSITION - REAL AND MONETARY VARIABLES

Variable	Percentage of Variance by Government Expenditure Shock at quarter				
	0	2	4	8	12
GOVERNMENT EXPENDITURE	**3.7**	**2.7**	**2.3**	**1.7**	**1.5**
United States					
US UNEMPLOYMENT RATE	2.9	1.6	3.7	6.9	8.0
US INDUSTRIAL PRODUCTION - CONSUMER GOODS	1.5	4.1	7.1	9.5	9.9
US INDUSTRIAL PRODUCTION - CONSTRUCTION MATERIALS	3.5	20.2	28.7	32.8	33.0
US INDUSTRIAL PRODUCTION - DURABLE GOODS	0.0	17.7	21.3	23.1	23.9
US INDUSTRIAL PRODUCTION - INVESTMENT GOODS (INCL. DEFENCE)	0.4	11.5	16.1	20.3	21.2
US CPI	0.2	0.6	0.3	0.2	0.3
US CPI ENERGY	0.0	0.2	0.1	0.4	0.7
US FEDERAL FUNDS RATE	17.6	7.0	3.7	1.7	1.2
US YIELD 10 - YEAR FEDERAL GOVERNMENT SECURITIES (COMPOSITE)	1.5	6.3	7.7	9.6	10.2
US SHARE PRICE INDEX - NYSE COMMON STOCKS	3.9	5.9	8.9	12.3	13.2
US REAL EFFECTIVE EXCH.RATE INDEX - NORMALIZED LABOR COST BASED	3.7	7.9	5.0	4.3	4.7
Canada					
CN STANDARDIZED UNEMPLOYMENT RATE	2.1	0.9	2.2	3.5	3.7
CN INDUSTRIAL PRODUCTION - INDUSTRY EXCLUDING CONSTRUCTION	3.1	2.6	5.9	9.7	10.8
CN INDUSTRIAL PRODUCTION - MANUFACTURING	1.6	5.1	10.1	15.2	16.8
CN INDUSTRIAL PRODUCTION - CONSUMER NON	0.3	4.1	8.4	12.7	13.6
CN INDUSTRIAL PRODUCTION	0.1	4.9	8.3	12.1	13.0
CN CPI - ALL ITEMS (MONTREAL)	2.8	8.5	10.2	9.3	8.5
CN CPI ENERGY	0.2	0.1	0.4	1.6	2.0
CN MONEY MARKET RATE (FEDERAL FUNDS)	17.9	15.8	12.1	7.9	6.6
CN YIELD 10 - YEAR FEDERAL GOVERNMENT BENCHMARK BONDS	0.0	1.5	2.6	4.7	5.2
CN SHARE PRICES - TSE 300 COMPOSITE	1.5	1.4	2.0	2.6	2.7
CN CAD/USD EXCHANGE RATE INDEX	17.8	25.9	26.8	29.3	30.4
CN REAL EFFECTIVE EXCHANGE RATE INDEX - CPI BASED	9.3	15.3	20.4	23.4	23.8
CN TRADE VARIABLES					
Import					
MOTOR VEHICLE PARTS, EXCEPT ENGINES	0.1	3.9	4.9	6.6	7.2
PASSENGER AUTOMOBILES AND CHASSIS	0.2	3.0	2.3	2.7	2.9
ELECTRONIC COMPUTERS	1.3	0.6	0.3	0.5	0.6
TRUCKS, TRUCK TRACTORS AND CHASSIS	0.3	2.0	2.2	2.8	2.9
ELECTRONIC TUBES & SEMI-CONDUCTORS	4.0	2.6	1.8	1.0	0.7
OTHER TELECOMMUNICATION & REL. EQUIP.	2.9	3.4	2.8	1.9	1.5
MOTOR VEHICLE ENGINES	0.6	0.8	0.9	1.4	1.5
ORGANIC CHEMICALS	1.4	1.0	0.9	1.1	1.1
SPECIAL TRANSACTIONS TRADE	0.7	0.4	0.4	0.3	0.3
OTHER CHEMICAL PRODUCTS	0.6	0.6	0.4	0.5	0.5
MISCELLANEOUS EQUIPMENT AND TOOLS	0.5	2.8	3.8	5.3	5.9
PLASTICS MATERIALS, NOT SHAPED	4.3	2.6	2.8	3.3	3.4
Export					
PASSENGER AUTOMOBILES AND CHASSIS	1.0	1.5	2.1	2.6	2.7
NATURAL GAS	0.4	0.2	0.4	0.8	1.0
CRUDE PETROLEUM	0.4	0.2	0.2	0.7	0.8
MOTOR VEHICLE ENGINES AND PARTS	0.1	3.8	4.9	5.6	5.6
MOTOR VEHICLE PARTS, EXCEPT ENGINES	0.1	6.0	8.0	10.2	10.8
TRUCKS, TRUCK TRACTORS AND CHASSIS	2.4	1.7	1.4	1.0	0.8
PETROLEUM AND COAL PRODUCTS	0.9	1.5	1.4	2.3	2.7
NEWSPRINT PAPER	13.3	16.9	16.1	14.9	14.3
LUMBER, SOFTWOOD	0.8	2.8	3.3	3.3	3.2
WOOD PULP AND SIMILAR PULP	15.8	16.8	13.4	10.2	9.1
ALUMINUM, INCLUDING ALLOYS	4.8	3.7	2.6	1.6	1.2
OTHER TELECOMMUNICATION & REL. EQUIP.	0.0	0.0	0.1	0.5	0.7
OFFICE MACHINES AND EQUIPMENT	0.4	0.1	0.4	0.8	0.9

APPENDIX A – DATA DESCRIPTION

All series except those on trade were taken from the Datastream database. Main imports and exports are from Canada Statistics. The transformation code are as follows: 1, level; 2, first difference; 3, second difference; 4, log-level; 5, log-first-difference; 6, log-second-difference. Slow-moving series = 1. Idiosyncratic error term and the fraction of the variance explained by dynamic factors – where k = 1st, 2nd, 3rd, 4th and their total – at the 8-quarters ahead forecast error variance decomposition for individual series.

	Tcode	Slow	Idiosyncratic	8-Quarters Ahead Forecast Error Decompositions for Individual Series				
				Fraction of variance explained by factors 1, …, q:				
				1	2	3	4	Total
US								
Government								
Finance								
GOVERNMENT EXPENDITURE ON DEFENCE	5	1	0.83	0.09	0.00	0.07	0.00	0.17
GOVERNMENT EXPENDITURE	5	0	0.88	0.05	0.00	0.06	0.01	0.12
CORPORATE INCOME TAXES	5	1	0.57	0.33	0.00	0.05	0.05	0.43
PERSONAL INCOME TAXES	5	1	0.93	0.02	0.02	0.01	0.02	0.07
PRODUCTION AND IMPORT TAXES	5	1	0.91	0.00	0.03	0.05	0.00	0.09
Employment								
US PART TIME EMPLOYMENT VOLA	5	1	0.75	0.22	0.02	0.01	0.01	0.25
US EMPLOYMENT – CIVILIAN VOLA	5	1	0.69	0.21	0.07	0.02	0.01	0.31
US EMPLOYMENT ESTABLISHMENT – NONFARM VOLA	6	1	0.47	0.21	0.28	0.00	0.04	0.53
US EMPLOYMENT – MANUFACTURING VOLA	6	1	0.48	0.30	0.20	0.01	0.01	0.52
US UNEMPLOYMENT - SHORT	5	1	0.57	0.38	0.03	0.01	0.01	0.43
US STANDARDIZED UNEMPLOYMENT RATE SADJ	5	1	0.38	0.55	0.06	0.00	0.01	0.62
US LABOUR FORCE VOLA	5	1	0.93	0.02	0.01	0.03	0.01	0.07
US EMPLOYMENT RATE	5	1	0.49	0.48	0.02	0.00	0.01	0.51
US HELP WANTED ADVERTISING SADJ	6	1	0.62	0.13	0.24	0.00	0.00	0.38
US OVERTIME HOURS – MANUFACTURING WEEKLY VOLA	5	1	0.48	0.28	0.22	0.00	0.01	0.52
US HOURS OF WORK – MANUFACTURING WEEKLY VOLA	5	1	0.53	0.20	0.25	0.00	0.01	0.47
US HOURLY EARNINGS MANUFACTURING SADJ	5	1	0.65	0.27	0.01	0.05	0.02	0.35
Output								
US INDUSTIRAL PRODUCTION – CONSUMER GOODS VOLA	5	1	0.49	0.29	0.12	0.07	0.03	0.51
US INDUSTRIAL PRODUCTION – CONSTRCUTION MATERIALS VOLA	5	1	0.46	0.09	0.42	0.00	0.03	0.54
US INDUSTRIAL PRODUCTION – DURABLE GOODS VOLA	6	1	0.44	0.20	0.33	0.01	0.01	0.56
US INDUSTRIAL PRODUCTION – INVESTMENT GOODS (INCL DEFENCE) VOLA	6	1	0.50	0.24	0.21	0.05	0.01	0.50
US INDUSTRIAL PRODUCTION – CONSUMER NON	5	1	0.59	0.20	0.20	0.00	0.02	0.41
US BUSINESSS TENDENCY SURVEY MFG. – CONFIDENCE INDICATOR SADJ	5	0	0.30	0.22	0.47	0.00	0.00	0.70
US BUSINESS TENDENCY SURVEY MANUFACTURING – EMPLOYMENT SADJ	2	1	0.40	0.41	0.17	0.01	0.00	0.60
US BUSINESS TENDENCY SURVEY MANUFACTURING – ORDERS INFLOW SADJ	2	1	0.36	0.20	0.40	0.01	0.03	0.64
US BUSINESS TENDENCY SURVEY MANUFACTURING – PRODUCTION SADJ	2	1	0.38	0.24	0.35	0.01	0.02	0.62
US BUSINESS TENDENCY SURVEY MFG – RAW MATERIALS STOCKS SADJ	2	1	0.77	0.18	0.04	0.01	0.00	0.23
Consumer and retail confidence								
US CONSUMER OPINION SURVEY CONFIDENCE INDICATOR SADJ	5	1	0.38	0.38	0.08	0.12	0.03	0.62
US RETAIL SALES – PASSENGER CARS (PROXY) VOLA	5	1	0.92	0.00	0.03	0.01	0.03	0.08
US RETAIL SALES VOLA	5	1	0.80	0.01	0.16	0.01	0.02	0.20
Prices								
US CPI SADJ	5	1	0.12	0.26	0.07	0.54	0.00	0.88
US CPI – WAGE EARNERS NADJ	5	1	0.12	0.25	0.05	0.58	0.00	0.88
US CPI FOOD EXCEL RESTAURANTS NADJ	5	1	0.87	0.06	0.02	0.03	0.03	0.13
US CPI ENERGY NADJ	5	1	0.15	0.22	0.02	0.60	0.01	0.85
US CPI – EXCLUDING FOOD & ENERGY NADJ	5	1	0.72	0.06	0.18	0.04	0.00	0.28
Money								
US MONEY SUPPLY – BORADMONEY (M2) CURA	5	0	0.65	0.29	0.00	0.03	0.03	0.35
US MONEY SUPPLY – M3 CURA	5	0	0.88	0.07	0.00	0.00	0.05	0.12
US MONEY SUPPLY – M1 CURA	5	0	0.68	0.24	0.05	0.03	0.00	0.32
Interest rates								
US FEDERAL FUNDS RATE NADJ	2	0	0.23	0.70	0.04	0.02	0.01	0.77
US PRIME RATE NADJ	2	0	0.20	0.70	0.06	0.03	0.01	0.80
US YIELD 10 – YEAR FEDERAL GOVERNMENT SECURITIES (COMPOSITE) NADJ	2	0	0.44	0.39	0.09	0.07	0.00	0.56
US YIELD 10 – YEAR FEDERAL GOVERNMENT SECURITIES NADJ	2	0	0.29	0.53	0.07	0.10	0.00	0.71
US DISCOUNT RATE (EP)	2	0	0.23	0.64	0.06	0.06	0.01	0.77
US 6 – MONTH US $ DEPOSITS LONDON OFFER CURN	2	0	0.17	0.77	0.02	0.03	0.01	0.83
US 1 – YEAR US $ DEPOSITS LONDON OFFER	2	0	0.14	0.81	0.01	0.03	0.01	0.86
US GOVT BOND YIELD – MEDIUM TERM	2	0	0.17	0.75	0.03	0.05	0.01	0.83
Stock prices and exchange rates								
US SHARE PRICE INDEX NADJ	5	0	0.53	0.00	0.03	0.00	0.45	0.48
US SHARE PRICE INDEX- NYSE COMMON STOCKS NADJ	5	0	0.54	0.01	0.04	0.00	0.39	0.44
US REAL EFFECTIVE EXCHANGE RATES VOLN	5	0	0.69	0.24	0.06	0.00	0.01	0.31
US NOMINAL EFFECTIVE TRADE – WEIGHTED EXCHANGE RATE INDEX NADJ	5	0	0.67	0.24	0.08	0.01	0.00	0.33
US REAL EFFECTIVE EXCHANGE RATE INDEX – CPI BASED SADJ	5	0	0.67	0.28	0.04	0.01	0.00	0.33

9

US REAL EFFECTIVE EXH RATE INDEX – NORMALIZED LABOUR COST BASED	5	0	0.69	0.24	0.06	0.01	0.00	0.31

CANADA								
Employment								
CN EMPLOYMENT – CIVILIAN VOLA	5	1	0.50	0.27	0.16	0.03	0.04	0.50
CN STANDARIZED UNEMPLOYMENT RATE SADJ	5	1	0.70	0.18	0.07	0.05	0.00	0.30
CN UNIT LABOUR COST SADJ	5	1	0.41	0.38	0.16	0.03	0.02	0.59
Output								
CN INDUSTRIAL PRODN – REAL DOMESTIC PRODUCT CONSTRUCTION VOLA	5	1	0.83	0.04	0.04	0.08	0.01	0.17
CN INDUSTRIAL PRODUCTION – INDUSTRY EXCLUDING CONSTRUCTION VOLA	5	1	0.24	0.64	0.10	0.01	0.01	0.76
CN INDUSTRIAL PRODUCTION – MANUFACTURING VOLA	5	1	0.22	0.54	0.20	0.02	0.01	0.78
CN INDUSTRIAL PRODN – REAL DOMESTIC PRODUCT SERVICES VOLA	5	1	0.52	0.03	0.40	0.01	0.03	0.48
CN INDUSTRIAL PRODUCTION – CONSUMER NON	5	1	0.45	0.39	0.13	0.01	0.02	0.55
CN INDUSTRIAL PRODUCTION SADJ	5	1	0.41	0.45	0.13	0.00	0.01	0.59
Consumer and retail confidence								
CN RETAIL SALES – PASSENGER CARS VOLA	5	1	0.75	0.00	0.18	0.04	0.02	0.25
CN RETAIL SALES VOLA	5	1	0.56	0.03	0.31	0.04	0.06	0.44
Prices								
CN CPI – ALL ITEMS (MONTREAL) NADJ	5	1	0.69	0.02	0.19	0.07	0.03	0.31
CN CPI ENERGY NADJ	5	1	0.23	0.26	0.03	0.48	0.00	0.77
CN CPI – EXCLUDING FOOD & ENERGY NADJ	5	1	0.75	0.01	0.18	0.00	0.06	0.25
CN CPI: HOUSING NADJ	5	1	0.45	0.06	0.41	0.04	0.05	0.55
CN CPI – SERVICES EXCLUDING RENT NADJ	5	1	0.93	0.02	0.03	0.01	0.02	0.07
Money								
CN MONEY SUPPLY – M1 CURA	5	0	0.68	0.00	0.19	0.10	0.03	0.32
CN MONEY SUPPLY – BROAD MONEY (M2+) CURA	5	0	0.83	0.11	0.00	0.05	0.00	0.17
Interest rates								
CN YIELD 10 - YEAR FEDERAL GOVERNMENT BENCHMARK BONDS NADJ	2	0	0.42	0.51	0.02	0.04	0.00	0.58
CN MONEY MARKET RATE (FEDERAL FUNDS)	2	0	0.43	0.36	0.20	0.00	0.01	0.57
CN DEPOSIT RATE	2	0	0.5	0.52	0.12	0.01	0.00	0.65
Stock prices and exchange rates								
CN SHARE PRICES – TSE 300 COMPOSITE NADJ	5	0	0.50	0.04	0.08	0.07	0.30	0.50
CN CAD/USD EXCHANGE RATE INDEX NADJ	5	0	0.46	0.03	0.02	0.07	0.41	0.54
CN US $ TO NATIONAL CURRENCY UNIT – EXCH RATE (AVG)	5	0	0.38	0.00	0.01	0.07	0.53	0.62
CN REAL EFFECTIVE EXCHANGE RATE INDEX – CPI BASED SADJ	5	0	0.38	0.01	0.02	0.05	0.54	0.62
Other Price index								
CN PPI NADJ	5	1	0.24	0.60	0.05	0.03	0.09	0.76
CN PPI – FOOD & BEVERAGES NADJ	5	1	0.87	0.11	0.00	0.00	0.01	0.13
CN PPI - ELECTRICAL MACHINERY NADJ	5	1	0.53	0.30	0.07	0.07	0.03	0.47
CN PPI – PRIMARY METALS NADJ	5	1	0.53	0.43	0.02	0.01	0.01	0.47
CN PPI – CHEMICALS AND CHEMICAL PRODS NADJ	5	1	0.42	0.39	0.11	0.06	0.03	0.58
CN PPI – PAPER & ALLIED INDUSTRIES NADJ	5	1	0.59	0.25	0.07	0.02	0.06	0.41
CN PPI – REFINED PETROLEUM & COAL PRODUCTS NADJ	5	1	0.19	0.26	0.04	0.51	0.00	0.81
Orders								
CN MANUFACTURING – DELIVERIES CURA	5	1	0.28	0.62	0.05	0.00	0.05	0.72
CN MANUFACTURING – DELIVERIES DURABLE GOODS CURA	5	1	0.66	0.42	0.11	0.07	0.05	0.64
CN MANUFACTURING – ORDERS CURA	5	1	0.35	0.59	0.03	0.00	0.03	0.65
CN MANUFACTURING – STOCKS CURA	5	1	0.64	0.24	0.06	0.01	0.05	0.36
CN MANUFACTURING – STOCKS FINISHED GOODS CURA	5	1	0.76	0.12	0.10	0.02	0.00	0.24
CN STOCKS MATERIALS CURA	6	1	0.71	0.12	0.03	0.03	0.12	0.29
Composite leading indicator								
CN COMPOSITE LEADING IDICATOR HOUSING STARTS – LARGE CITIES VOLA	2	0	0.35	0.07	0.56	0.01	0.02	0.65
CN COMPOSITE LEADING INDICATOR WEEKLY HOURS OF WORK (MFG) VOLA	5	0	0.85	0.02	0.08	0.01	0.04	0.15
CN COMPOSITE LEADING INDICATOR – REFERENCE SERIES (IIP) SADI	2	0	0.28	0.67	0.04	0.00	0.01	0.72
CN COMPOSITE LEADING INDICATOR DEFLATED MONEY SUPPLY (M1) CONA	5	0	0.65	0.01	0.25	0.04	0.05	0.35
Fixed capital								
CN CONSTRUCTION – DWELLINGS STARTED VOLA	5	1	0.34	0.06	0.57	0.00	0.01	0.66
CN CONSTRUCTION – BUILDING PERMIST ISSUED RESIDENTIAL CURA	5	1	0.49	0.06	0.44	0.01	0.00	0.51
Balance of Payment								
CN INTERNATIONAL RESERVES CURN	5	0	0.81	0.02	0.00	0.08	0.09	0.19
CN FUND POSITION SDR'S CURN	5	0	0.93	0.00	0.01	0.05	0.00	0.07
CN RESERVE POSITION IN THE FUND CURN	2	0	0.76	0.13	0.04	0.08	0.00	0.24
CN FOREIGN EXCHANGE RESERVES CURN	5	0	0.82	0.01	0.00	0.09	0.07	0.18
Credit and debit								
CN BANKING INSTS: DMENAD DEPS: OTHER RESD. SECTS. IN CNTY CURN	5	0	0.68	0.07	0.12	0.11	0.01	0.32
CN CENTRAL BANK RESERVE MONEY CURN	5	0	0.86	0.06	0.05	0.01	0.02	0.14
CN BANKING INSTS: FOREIGN LIABILITIS CURN	5	0	0.68	0.03	0.04	0.09	0.16	0.32
CN CENTRAL BANK: CURRENCY INCIRULATION CURN	5	0	0.84	0.05	0.05	0.01	0.06	0.16
CN CREDIT TO PRIVATE SECTOR CURN	6	0	0.67	0.09	0.22	0.01	0.01	0.33
CN FUND POSITION: HOLDINGS OF CURRENCY CURN	5	0	0.80	.018	0.01	0.01	0.00	0.20

CN CENTRAL BANK; CLAIMS ON GOVERNMENT IN COUNTRY CURN	5	0	0.71	0.01	0.09	0.19	0.00	0.29
CN BANKING INSTS: RESERVES CURN	5	0	0.86	0.06	0.03	0.04	0.00	0.14
CN BANKING INSTS: FOREIGN ASSETS CURN	5	0	0.67	0.08	0.06	0.01	0.18	0.33
CN DOMESTIC CREDIT CURN	5	0	0.77	0.12	0.00	0.08	0.03	0.23
Import								
CN – IMPORTS: MOTOR VEHICLE PATS, EXCEPT ENGINES	5	0	0.54	0.13	0.05	0.15	0.12	0.46
CN – IMPORTS: PASSENGER AUTOMOBILES AND CHASSIS	5	0	0.84	0.06	0.04	0.05	0.01	0.16
CN – IMPORTS: ELECTORNIC COMPUTERS	5	0	0.77	0.20	0.02	0.00	0.01	0.23
CN – IMPORTS: TRUCKS, TRUCK TRACTORS AND CHASSIS	5	0	0.83	0.09	0.04	0.03	0.01	0.17
CN – IMPORTS: ELECTRONIC TUBES AND SEMI CONDUCTORS	5	0	0.71	0.24	0.04	0.01	0.00	0.29
CN – IMPORTS: OTHER TELECOMMUNICATION AND REL EQUIP	5	0	0.73	0.10	0.11	0.04	0.02	0.27
CN – IMPORTS: MOTOR VEHICLE ENGINES	5	0	0.65	0.07	0.02	0.19	0.08	0.35
CN – IMPORTS: ORGANIC CHEMICALS	5	0	0.79	0.16	0.02	0.01	0.02	0.21
CN – IMPORTS: SPECIAL TRANSACTIONS TRADE	5	0	0.98	0.00	0.00	0.01	0.00	0.02
CN – IMPORTS: OTHER CHEMICAL PRODUCTS	5	0	0.69	0.05	0.03	0.14	0.08	0.31
CN – IMPORTS: MISCELLANEIOUS EQUIPMENT AND TOOLS	5	0	0.82	0.06	0.02	0.01	0.09	0.18
CN – IMPORTS: PLASTICS MATERIALS, NOT SHAPED	5	0	0.50	0.37	0.04	0.05	0.04	0.50
Export								
CN – EXPORTS: PASSENGER AUTOMOBILES AND CHASSIS	5	0	0.57	0.09	0.03	0.23	0.09	0.43
CN – EXPORTS: NATURAL GAS	5	0	0.71	0.07	0.03	0.18	0.01	0.29
CN – EXPORTS: CRUDE PETROLEUM	5	0	0.33	0.09	0.04	0.53	0.00	0.67
CN – EXPORTS: MOTOR VEHICLE ENGINES AND PARTS	5	0	0.77	0.07	0.08	0.06	0.02	0.23
CN – EXPORTS: MOTOR VEHILCE PARTS, EXCEPT ENGINES	5	0	0.70	0.12	0.08	0.04	0.06	0.30
CN – EXPORTS: TRUCKS, TRUCK TRACTORS AND CHASSIS	5	0	0.90	0.05	0.03	0.01	0.02	0.10
CN – EXPORTS: PETROLEUM AND COAL PRODUCTS	5	0	0.48	0.12	0.02	0.35	0.03	0.52
CN – EXPORTS: NEWSPRING PAPER	5	0	0.82	0.01	0.04	0.05	0.07	0.18
CN – EXPORTS: LUMBER SOFTWOOD	5	0	0.75	0.03	0.21	0.00	0.01	0.25
CN – EXPORTS: WOOD PULP AND SIMILAR PULP	5	0	0.65	0.18	0.07	0.03	0.07	0.35
CN – EXPORTS: ALUMINIUM, INCLUDING ALLOYS	5	0	0.99	0.25	0.03	0.01	0.02	0.31
CN – EXPORTS: OTHER TELECOMMUNICATION AND REL EQUIP	5	0	0.70	0.24	0.06	0.01	0.00	0.30
CN – EXPORTS: OFFICE MACHINES AND EQUIPMENT	5	0	0.73	0.24	0.01	0.00	0.02	0.27