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Value added tax and inflation: A graphical and statistical analysis

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Value Added Tax and Inflation:

A Graphical and Statistical Analysis

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Abstract

The US has been considering introducing a National Consumption Tax federally. This would be in addition to the states' sales taxes. Since a consumption tax would be an added cost to the consumer, it would be expected that inflation would be increased. This paper uses graphs and statistical methods to ascertain whether inflation in the UK and Canada was affected by the introduction or change in rate of the Value Added Tax (or Goods and Services Tax). It was found that the introduction of a VAT in the UK showed no significant effect on the rate of change of CPI, whereas the introduction of GST in Canada did have a significant increase in the rate of CPI. It was also found that when the tax rates were changed substantially, inflation was affected; however, modest changes in the tax rate did not affect inflation.

Keywords: Value Added Tax, Inflation, Consumer Price Index, Consumption Tax, United Kingdom, Canada, United States

1. Introduction

The United States has debated establishing some kind of consumption tax - a national sales tax or national value added tax (VAT) - for many years, even introducing legislation; for example the Fair Tax Act 2013 (H.R. 25) and National Retail Sales Tax Act of 1997 (H.R.1325). Although these bills have not become law the debate continues. Some states, however, have some modified version of a VAT - Michigan has the 'single business tax' and New Hampshire has the 'business enterprise tax'. The U.S. Treasury has also looked into introducing a VAT type tax to replace the corporate tax (U.S. Treasury, 2007). As a more comprehensive tax reform, Graetz has proposed that most taxpayers would be removed from paying income tax but there would a national VAT instead (Graetz, 2010).

Consumption taxes are indirect taxes. They can be single stage (e.g., Sales Tax) or multi-stage (Value-Added Tax). The first major country to have a value-added tax (VAT) was France in 1954. Since then, at least 125 countries (including all the European Union countries) have adopted a VAT, under a variety of different names. A common alternative name is the Goods and Services Tax (GST), used in a number of countries including Canada. VAT and GST are multi-stage consumption taxes with credits.

With the US considering enacting a VAT style national consumption tax, possibly a multi-stage one, this paper looks at the possible impact on consumer price index that such a tax may have. Two countries with similar economies and common law legal structures, namely the United Kingdom (UK) and Canada, will be analyzed. The paper will look at two aspects, the introduction of a Value Added Tax on consumer price index and the change of rate of the VAT on consumer price index.

The United Kingdom introduced its value added tax in April1973 at the rate of 10% as part of the UK's entry into the European Economic Community. The VAT superseded the purchase tax, a hidden tax charged at various rates. Over the years the rate of VAT changed a number of times. Between1975 and 1979, there was a "higher rate" on luxury goods. Luxury goods included domestic electrical appliances, radios, TVs and hi-fi equipment, furs and jewellery. The UK has changed the rate of its VAT several times over the years.

Canada introduced its Goods and Services Tax in January 1991 at the rate of 7%. The rate remained stable for about 15 years. When introduced, the GST replaced the Manufacturers' Sales Tax (MST), a hidden tax charged on manufacturers at a 13.5% rate. The MST was a single-stage sales tax. This tax was generally applied to the manufacturer's sales price if the good was manufactured in Canada or, if the good was imported, to the customs value of the good.

Like the US, but unlike the UK, Canada has a federal system of government. The provinces (except Alberta) also charge a sales tax in addition to the federal GST (at rates between 7% and 10%).[1] The three territories do not charge their own sales tax.

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[1] Some provinces, mainly in the Maritimes and Ontario, harmonize their sales tax with the GST, this is called the Harmonized Sales Tax (HST). British Columbia had also harmonized in 2010, but in a referendum in August 2011, the citizens of BC voted to return to the provincial sales tax regime. This change was put into effective in April, 2013. On

Thus, the federal consumption tax is in addition to the provincial sales tax. To the consumer, the sum of the two taxes is the burden that is payable. If the US were to introduce a national consumption tax, it would be more like Canada. Most US states (45 out of the 50) have their own sales tax (counties and municipalities can also have their own sales taxes, even in some cases where there is no general state sales tax). This would mean that any national consumption tax in the US would be in addition to the state and local sales taxes.

This paper is organized as follows: after this introduction there is the literature review followed by the section setting out the research questions. The methodology section is next, followed by the graphical and statistical results and comments. The paper ends with the conclusion.

2. Literature Review

A number of studies have examined whether the U.S. should introduce a national sales tax or a national valued-added tax (Metcalf, 1995; Mikesell, 1997, 2003; Zodrow, 1999; Gale, 2005; the President's Advisory Panel, 2005). A national value-added tax is still a matter of debate Schenk, 2011). In 2005 the President's Advisory Panel recommended against a national consumption tax, mainly due to the administrative costs and possible regressivity. There is a common perception that a national consumption tax would be regressive (Gale, Houser & Sholtz, 1996). Further, it has been suggested that if the burden of a National Sales tax falls more heavily on the lower income taxpayers, then the volume of retail sales may decrease (Feenberg, Mitrusi & Poterba, 1997). However, it is not necessarily the case that a national sales tax cannot be progressive (Metcalf, 1997). In fact, the VAT system in the Dominican Republic has been found to be progressive (Jenkins, Jenkins & Kuo, 2006). Caspersen & Metcalf (1995) state that a value-added tax in the U.S. could be only mildly regressive or even progressive. It has been found that the introduction of VAT in the UK in 1973 had only small distributional effects (Whalley, 1975).

Few studies have examined the impact on inflation due to the introduction of a national retail consumption tax. The Office for National Statistics (in the UK) estimated that the Consumer Price index increased by 0.76% in January 2011 on the increase of VAT from 17.5% to 20%. The reduction of the rate of VAT in December 2008, was found to have a very limited drop in the CPI (Pike, Lewis & Turner, 2009). They estimated that the CPI for December 2008 dropped by 0.5%, but by February had risen again to levels higher than November 2008. Esenwein and Gravelle (2004) in a Congressional Research Service paper stated that the introduction of a consumption tax would likely give a one-time price inflation to avoid an economic contraction. However, this is not certain. It has been found that retail prices rise by the amount of the retail sales tax when looking at states in some circumstances only (Poterba, 1996). Extending this to the introduction of a VAT, it has been suggested that such an introduction may lead to a one-time increase in prices, but there is little empirical evidence of any long-term increase (Gale & Harris, 2011). Thus, there is uncertainty as to the effect of introducing a national consumption tax on inflation. The inflationary effects of changes in the rate of VAT are also uncertain. In Germany, it was found that increasing the VAT rate from 16% to 19% had a price effect, in contrast to small prior changes where there was no effect

that date, Prince Edward Island introduced HST in the province.

(Deutsche Bundesbank, 2008) It has been suggested that when a consumption tax replaces an income tax, individuals tend to save more initially and to consume less, possibly leading to retailers lowering prices. Later, however, consumption eventually overtakes that of the original path, and there is higher consumption and a greater capital stock. (Fullerton, Shoven & Whalley, 1983).

This study examines inflationary effect of both at the introduction of a national consumption tax and at the times the tax rate is changed. Some insight for the US can be obtained by observing changes in the consumer price indices in the UK and Canada, countries which have similar economies to the US.

3. Research Questions

The goal of this project is to establish whether the introduction of a National Value-Added tax in the United States is likely to increase inflation. This study will analyze the effect of the introduction of a National Value Added Tax (on Goods and/or Services) on the Consumer Price Index of the country in question. One of the main arguments forwarded against introducing a national VAT or Sales Tax in the United States is that it would create a substantial increase in prices of every-day goods. This is inflation would increase due to the new tax. As a number of countries with advanced economies (similar to United States) have introduced national value-added taxes in the last 30 years or so, it is important to ascertain the validity of the argument by analyzing how the new taxes affected inflation in those counties.

This study is designed to extend prior research by investigating the following questions:

A) Did the introduction of a National Value-Added Tax increase the CPI in the countries where such a tax was introduced.

B) If there was an increase in CPI, was it an one-time increase or was it sustained over a period of time?

4. Methodology

Many factors influence the rate of inflation. One measure that is often used is the price of consumer goods as reported by the Consumer Price Index. To look at the possible effect of the introduction, and rate changes, of a VAT on inflation, it is necessary to observe the change in CPI (from the same period in the prior year) as close to the change as possible. Otherwise, it would be difficult to make the case that it was the change that caused or impacted the change in behavior. The Organization of Economic Co-Operation and Development (OECD, 1960-2008) does have data on CPI on a monthly basis for the US, UK and Canada. Data from the OECD, Main Economic Indicators are used in all the graphs and the statistical analysis.

The graphs show the percentage change in CPI in the month from the same month in the prior year. For example, the percentage change for April 1973 is the change in CPI rate in April 1973 from CPI rate of April 1972, as a percentage. This would account for any variation in CPI rate due to seasonality.

As changes in the rate of inflation is subject to many factors other than consumption taxes, the graphs will show the three months before the introduction (or rate change), the month of the introduction or rate change and the three months after. That is, there will be seven months observed in each graph.

This study will use an interrupted time-series analysis with the US and the other countries as controls. Each country can be used as a control as the introduction of the new tax occurred at different dates for each country. The model will be the standard interrupted time-series model:

$$Y = a + b_1 X_1 + e. \tag{1}$$

Where Y = Dummy variables for the dates that VAT was introduced or rate changed.

X_1 = Percentage change (from the prior year) in CPI in UK, US and Canada.

As mentioned above, the UK introduced VAT in April 1973 and Canada introduced GST in January 1991. Both events had been publicized in advance. This was also generally the case for the changes in the VAT (or GST) rates. The public knew in advance that the rate change would occur. Sometimes, the advance notice was some months; for example, the new Labour Party government in the UK announced in its November 1974 budget that it would introduce the higher rate tax on luxuries from April 1975. Other times the advance notice was very short. The new Conservative Party government in the UK, in its mid June 1979 budget, announced the increase of the VAT rates to 15% (from both the 8% standard rate and the 12.5% higher rate) to be effective about a week later.

In the analysis this study, the US changes in CPI rates were used as a control. Also, the change in CPI rate in Canada and the United Kingdom were also used as controls where there was no change in those countries (but the other country introduced the tax or had a rate change). For example, when the UK introduced VAT in April 1973, Canada did not and so both Canada and the US were used as controls. Similarly, when Canada introduced GST in January 1991, both the UK and the US were used as controls. These added controls would strengthen the analysis.

5. Results

5.1 Introduction of a VAT system

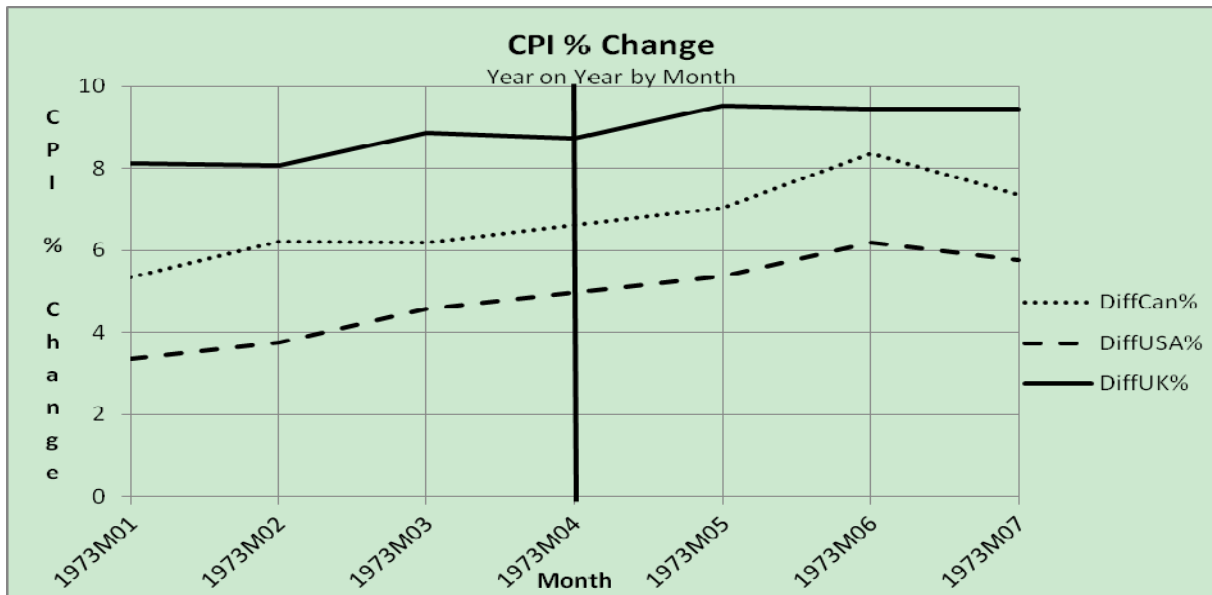5.1.1 April 1973: UK introduces VAT at 10%

Figure 1. UK introduces VAT April 1973: CPI change from same month prior year

Tables 1a&b. UK introduces VAT April 1973: CPI and Statistics

	Jan 1973	Feb 1973	Mar 1973	Apr 1973	May 1973	Jun 1973	Jul 1973
UK	**8.1**	**8.1**	**8.9**	**8.7**	**9.5**	**9.4**	**9.4**
US	3.3	3.7	4.6	5.0	5.4	6.2	5.8
Can	5.3	6.2	6.2	6.6	7.0	8.4	7.4

Statistical Results					
	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	.972	5.995		.162	.882
UK	**-.303**	**.826**	**-.352**	**-.367**	**.738**
US	.868	.854	1.687	1.017	.384
Can	-.285	.554	-.520	-.514	.643
R^2 = 0.772					

There is little evidence that the introduction of VAT in the United Kingdom had an effect on the country's inflation rate. Although the graph shows that there was a modest increase, this was no different from the control countries of Canada and the US, and was statistically insignificant. Part of the reason for this could be that the VAT replace the existing Purchase Tax. However, this can be contrasted with the change of CPI in Canada when that country introduced its Goods and Services Tax, below.

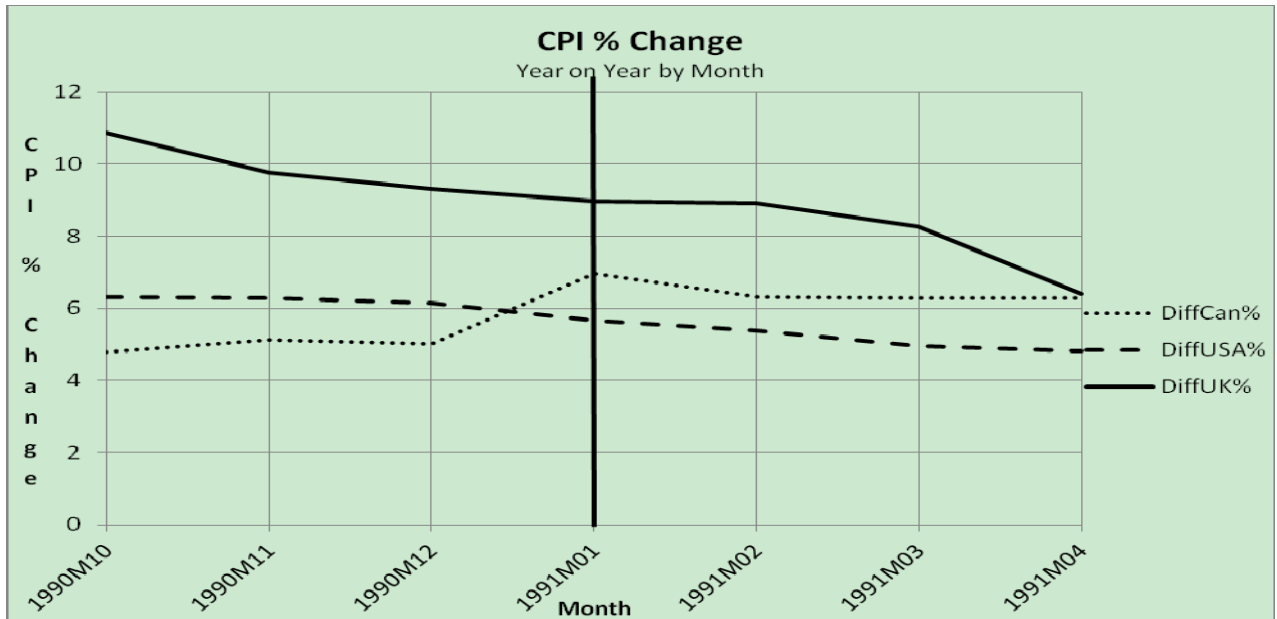## 5.1.2. January 1991 Canada Introduces GST at 7%

Figure 2. Canada introduces GST January 1991: CPI change from same month prior year

Tables 2a&b. Canada introduces GST January 1991: CPI and Statistics

	Oct 1990	Nov 1990	Dec 1990	Jan 1991	Feb 1991	Mar 1991	Apr 1991
Can	**4.8**	**5.1**	**5.0**	**7.0**	**6.3**	**6.3**	**6.3**
UK	10.9	9.8	9.3	9.0	8.9	8.3	6.4
US	6.3	6.3	6.1	5.7	5.4	5.0	4.8

		Statistical Results				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	.485	.685		.708	.530
	UK	.097	.046	.251	2.089	.128
	US	-.551	.119	-.647	-4.613	.019
	Can	**.401**	**.054**	**.625**	**7.466**	**.005**
$R^2 = 0.991$						

When Canada introduced of the Goods and Services Tax (GST) in January 1991, the change in the rate of CPI (from the prior year) increased from 5.0% to 7.0%. This increase was statistically significant. The CPI in the control countries, the US and the UK, decreased at this time. The Goods and Services Tax replaced the Manufacturer's Sales Tax (MST), which was first introduced in 1924. Thus, the results for Canada are different from those of the UK, when it introduced its VAT, above.

5.2 Changes in the rate of VAT: UK

5.2.1 July 1974 UK decreases VAT to 8%

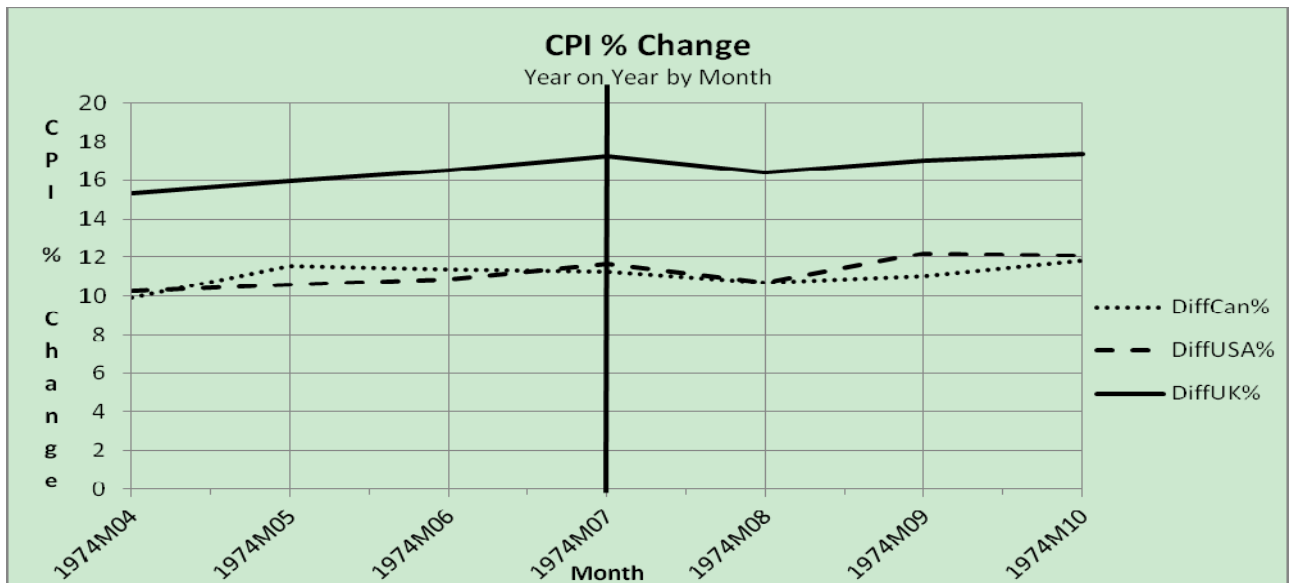Figure 3. UK decreases VAT to 8% July 1974: CPI change from same month prior year

Tables 3a&b. UK decreases VAT to 8% July 1974: CPI and Statistics

	Apr 1974	May 1974	Jun 1974	Jul 1974	Aug 1974	Sep 1974	Oct 1974
UK	**15.3**	**15.9**	**16.5**	**17.3**	**16.4**	**17.0**	**17.4**
US	10.3	10.6	10.9	11.7	10.7	12.2	12.1
Can	9.9	11.5	11.4	11.3	10.7	11.1	11.8

Statistical Results					
	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	-8.188	3.648		-2.244	.111
UK	**.880**	**.518**	**1.215**	**1.699**	**.188**
US	-.012	.426	-.018	-.029	.979
Can	-.510	.320	-.597	-1.594	.209
R^2 = 0.794					

When the UK lowered the rate of VAT to 8%, there was an increase in the rate of CPI (from the previous year) to July and then a decrease in the month following the change. This decrease was not sustained. Overall the graph shows a trend of increasing rates of inflation. It is possible that the effect of the change was manifested for the month following the change.

This seems to be logical as prices would have dropped after the change. However, statistically the results are insignificant.

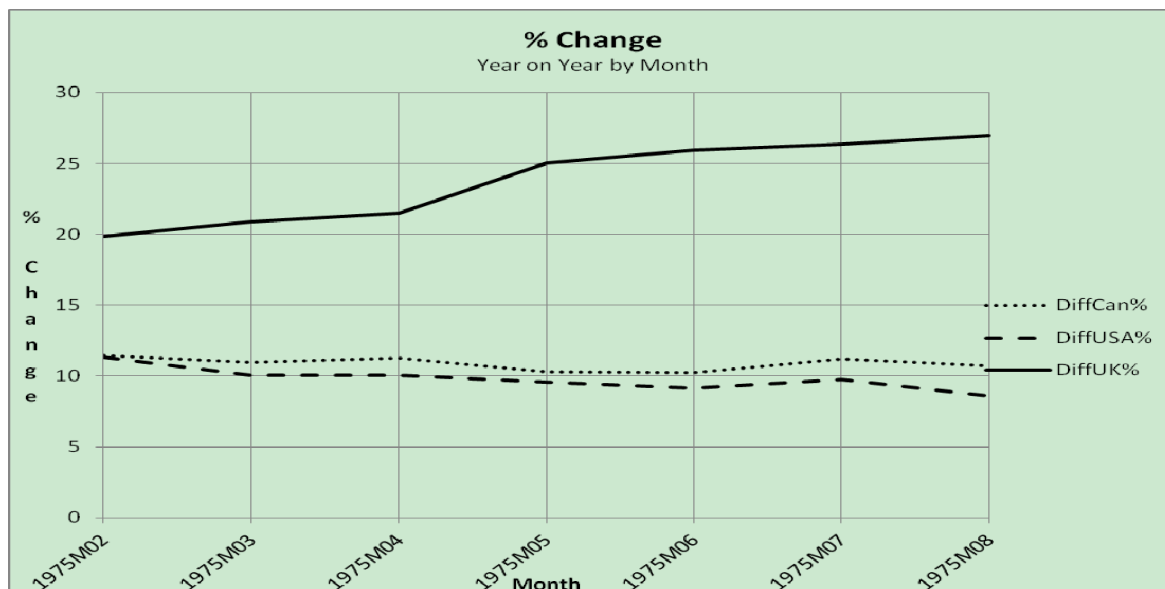5.2.2 May 1975 UK introduces higher rate of 25% for Luxury Goods

Figure 4. UK introduces higher rate of 25% for Luxury Goods May 1975: CPI change from same month prior year

Tables 4a&b. UK introduces higher rate of 25% for Luxury Goods May 1975: CPI and Statistics

	Feb 1975	Mar 1975	Apr 1975	May 1975	Jun 1975	Jul 1975	Aug 1975
UK	**19.9**	**20.9**	**21.5**	**25.0**	**25.9**	**26.4**	**27.0**
US	11.3	10.1	10.0	9.6	9.1	9.8	8.6
Can	11.5	11.0	11.3	10.3	10.2	11.2	10.8

Statistical Results		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	-4.026	.863		-4.662	.019
	UK	**.219**	**.014**	**1.203**	**16.083**	**.001**
	US	.301	.053	.478	5.718	.011
	Can	-.327	.059	-.292	-5.497	.012
$R^2 = 0.997$						

There was a significant increase in the rate of inflation (form 21.5% to 25.0%), when the UK introduced a higher rate of VAT on "luxury goods". It would seem that this increase was sustained over the following few months. The price of these luxury goods would have risen substantially. Luxury goods would have included such consumer goods as domestic electrical appliances, radios, TVs and hi-fi equipment, furs and jewellery. Repairs to these items would also have been subject to the higher rate tax. Thus, the introduction of a higher rate on luxury goods seems to have had a material effect on inflation, causing an immediate and sustained increase. The control countries, US and Canada, showed fairly stable CPI rates over this time period.

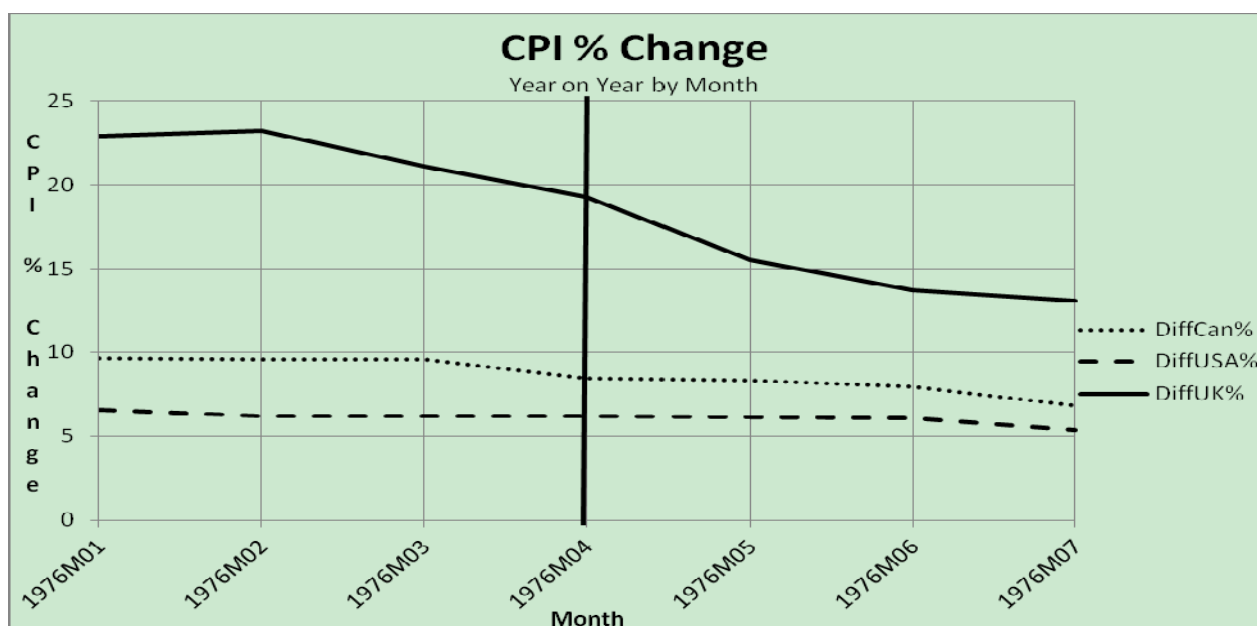### 5.2.3 April 1976 UK decreases higher rate to 12.5%

Figure 5. UK decreases higher rate to 12.5% April 1976: CPI change from same month prior year

Tables 5a&b. UK decreases higher rate to 12.5% April 1976: CPI and Statistics

	Jan 1976	Feb 1976	Mar 1976	Apr 1976	May 1976	Jun 1976	Jul 1976
UK	**22.9**	**23.2**	**21.1**	**19.3**	**15.5**	**13.7**	**13.1**
US	6.6	6.2	6.2	6.2	6.1	6.1	5.4
Can	9.7	9.6	9.6	8.4	8.4	7.9	6.8

Statistical Results					
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	.600	2.285		.263	.810
	UK	-.022	.073	-.177	-.305	.781
	US	.973	.634	.656	1.533	.223
	Can	-.647	.400	-1.270	-1.617	.204
$R^2 = 0.881$						

When the rate of VAT on "luxury goods" was lowered to 12.5%, the CPI rate decreased. Although, this trend that started two months before the change, it continued after the change at an accelerated rate. Since the rate had been dropping prior to the change in VAT rate and continued to drop after the change, it cannot be claimed that the change had any differential effect. This is borne out by the insignificant statistics.

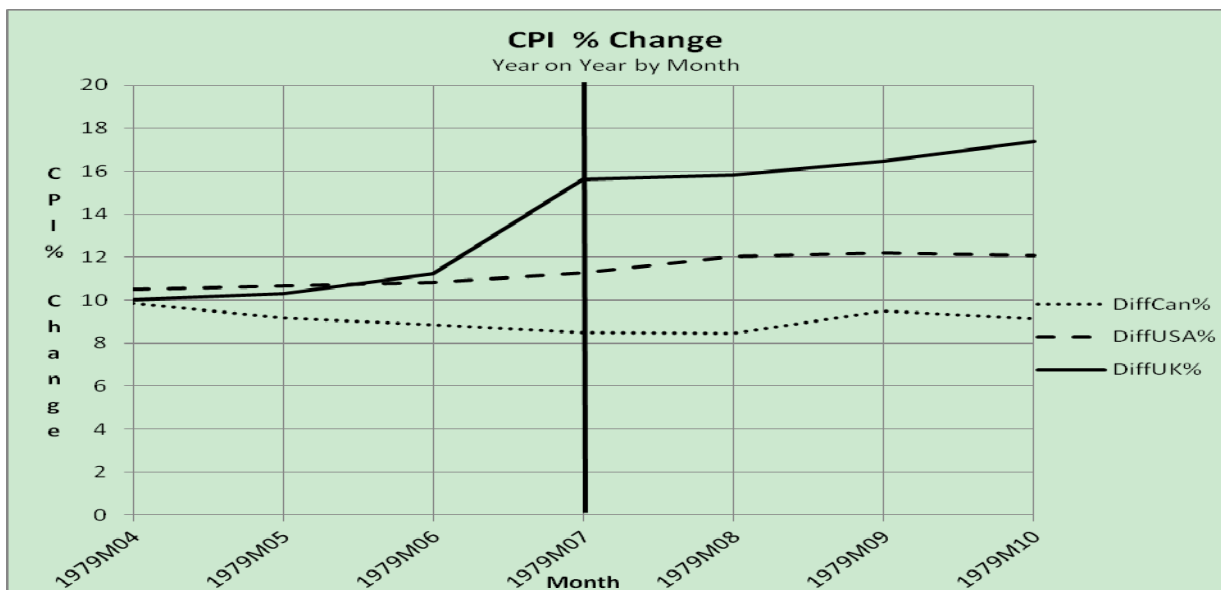5.2.4 June 1979: UK increase VAT to 15% for all goods

Figure 6. UK increase VAT to 15% for all goods June 1979: CPI change from same month prior year

Tables 6a&b. UK increase VAT to 15% for all goods June 1979: CPI and Statistics

	Apr 1979	May 1979	Jun 1979	Jul 1979	Aug 1979	Sep 1979	Oct 1979
UK	**10.0**	**10.3**	**11.2**	**15.6**	**15.8**	**16.4**	**17.4**
US	10.5	10.7	10.8	11.3	12.0	12.2	12.1
Can	9.9	9.2	8.9	8.5	8.5	9.5	9.1

Statistical Results					
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.645	2.293		-.281	.797
	UK	**.178**	**.065**	**1.058**	**2.754**	**.070**
	US	-.076	.274	-.102	-.278	.799
	Can	-.042	.140	-.041	-.300	.784
$R^2 = 0.958$						

The increase in the general rate of VAT from 10% to 15% showed a significant increase in the rate of inflation. CPI increased from 11.2% to 15.5% from June to July. This increase from the prior year was retained after the change came into effect. The control countries did not show the same increase and were statistically insignificant.

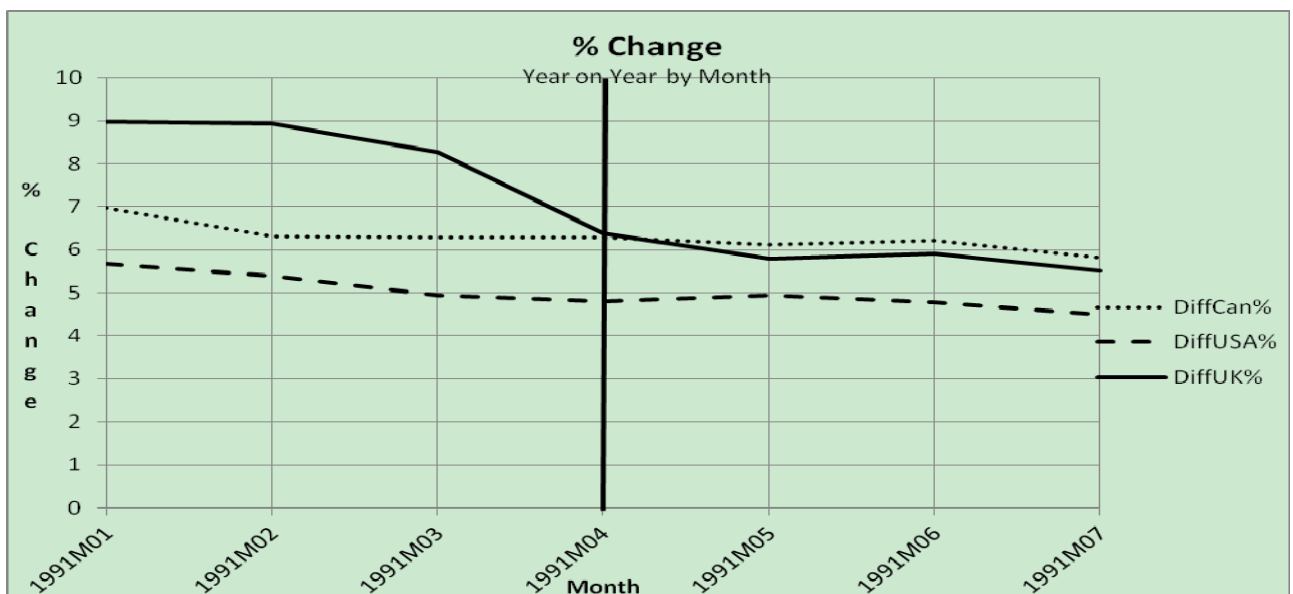5.2.5 April 1991 UK increases VAT to 17.5%

Figure 7. UK increases VAT to 17.5% April 1991: CPI change from same month prior year.

Tables 7a&b. UK increases VAT to 17.5% April 1991: CPI and Statistics

	Jan 1991	Feb 1991	Mar 1991	Apr 1991	May 1991	Jun 1991	Jul 1991
UK	**9.0**	**8.9**	**8.3**	**6.4**	**5.8**	**5.9**	**5.5**
US	5.7	5.4	5.0	4.8	4.9	4.8	4.5
Can	7.0	6.3	6.3	6.3	6.1	6.2	5.8

Statistical Results					
	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	1.499	1.258		1.191	.319
UK	**-.405**	**.073**	**-1.172**	**-5.533**	**.012**
US	.187	.414	.140	.452	.682
Can	.162	.354	.104	.458	.678
$R^2 = 0.967$					

In 1991 when the UK increased its rate of VAT again by a modest amount to 17.5%, the rate of CPI decreased by a statistically significant amount from 8.3% to 6.4%. This is counter to what would have been expected. It would seem that other factors influenced this decreased. Again, the control countries did not have any statistically significant changes in there CPIs.

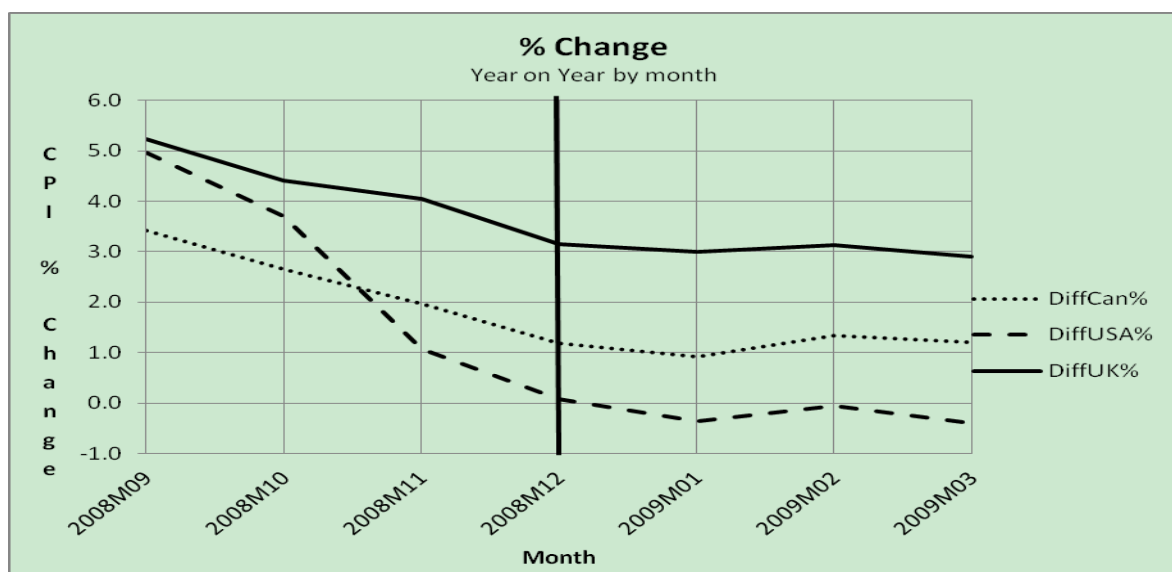### 1.2.1. December 2008 : UK decreased VAT to 15%

Figure 8. UK decreased VAT to 15% December 2008: CPI change from same month prior year

Tables 8a&b. UK decreased VAT to 15% December 2008: CPI and Statistics

	Sep 2008	Oct 2008	Nov 2008	Dec 2008	Jan 2009	Feb 2009	Mar 2009
UK	**5.2**	**4.4**	**4.1**	**3.2**	**3.0**	**3.1**	**2.9**
Can	3.4	2.6	2.0	1.2	0.9	1.3	1.2
US	5.0	3.7	1.1	0.1	-0.4	-0.1	-0.4

Statistical Results					
	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	3.888	1.722		2.258	.109
UK	**-.979**	**.747**	**-1.633**	**-1.311**	**.281**
US	.158	.290	.642	.545	.623
Can	.057	.984	.098	.058	.958
$R^2 = 0.864$					

The decrease of VAT in the UK from 17.5% to 15% in December 2008, shows a decrease in the rate of inflation from 4.1% to 3.2%. In the following months the CPI was fairly stable. It would appear that the decrease in VAT had a small impact on inflation that was sustained. However, the observed decrease is not statistically significant. The US and Canada both had decreases in their CPI at that time.

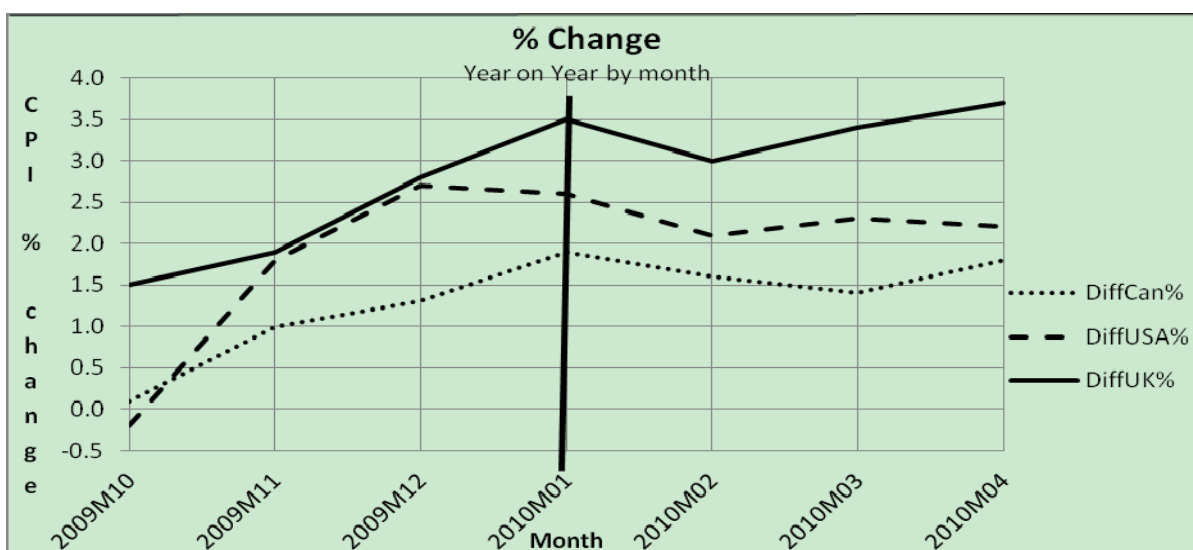5.2.6 January 2010: UK increases VAT to 17.5%

Figure 9. UK increases VAT to 17.5% January 2010: CPI change from same month prior year

Tables 9a&b. UK increases VAT to 17.5% January 2010: CPI and Statistics

	Oct 2009	Nov 2009	Dec 2009	Jan 2010	Feb 2010	Mar 2010	Apr 2010
UK	**1.5**	**1.9**	**2.8**	**3.5**	**3.0**	**3.4**	**3.7**
US	-0.2	1.8	2.7	2.6	2.1	2.3	2.2
Can	0.1	1.0	1.3	1.9	1.6	1.4	1.8

Statistical Results					
	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	-.829	.470		-1.766	.176
UK	**.469**	**.332**	**.733**	**1.409**	**.253**
US	-.479	.243	-.883	-1.970	.143
Can	.768	.627	.878	1.224	.308
$R^2 = 0.882$					

The increase of VAT in the UK from 15% to 17.5% in January 2010, shows an increase in the rate of inflation from 2.8% to 3.5%. However, this increase is not statistically significant. The trend at the time of change of the VAT rate was generally an increase (with a small drop from January to February). Both Canada and the US also had increases in their rate of inflation over the same period, thus one cannot conclude that the increase in VAT was influential in causing the increase in inflation in the UK.

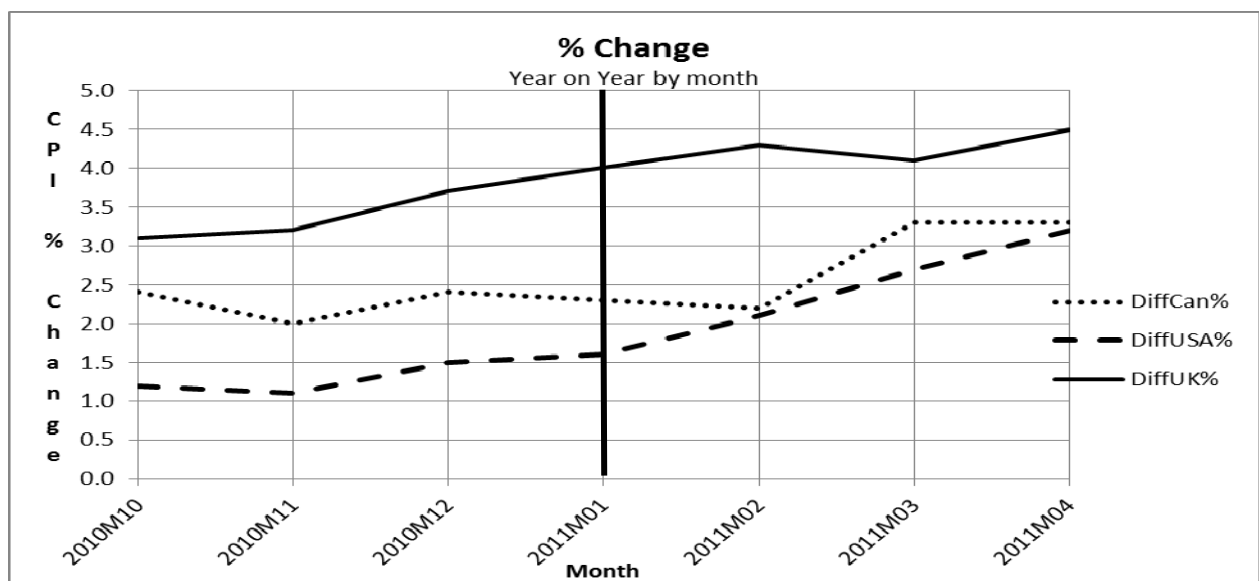5.2.7 January 2011: UK increases VAT to 20%

Figure 10. UK increases VAT to 20% January 2011: CPI change from same month prior year

Tables 10a&b. UK increases VAT to 20% January 2011: CPI and Statistics.

	Oct 2010	Nov 2010	Dec 2010	Jan 2011	Feb 2011	Mar 2011	Apr 2011
UK	**3.1**	**3.2**	**3.7**	**4.0**	**4.3**	**4.1**	**4.5**
Can	2.4	2.0	2.4	2.3	2.2	3.3	3.3
US	1.2	1.1	1.5	1.6	2.1	2.7	3.2

Statistical Results					
	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	-3.235	3.192		-1.013	.385
UK	**.979**	**.793**	**.980**	**1.235**	**.305**
US	-.115	.910	-.171	-.127	.907
Can	.103	.840	.101	.123	.910
$R^2 = 0.795$					

The increase of VAT in the UK from 17.5% to 20% in January 2011, shows a small increase in the rate of inflation from 3.7% to 4.0%. However, this increase is not statistically significant. The control countries showed differing changes in rate of inflation over the same period; the US CPI increased slightly from 1.5% to 1.6% and Canada's CPI decreased from 2.4% to 2.3%. Thus, again, one cannot conclude that the increase in VAT was influential in causing the increase in inflation in the UK.

5.3 Changes in the rate of VAT: Canada
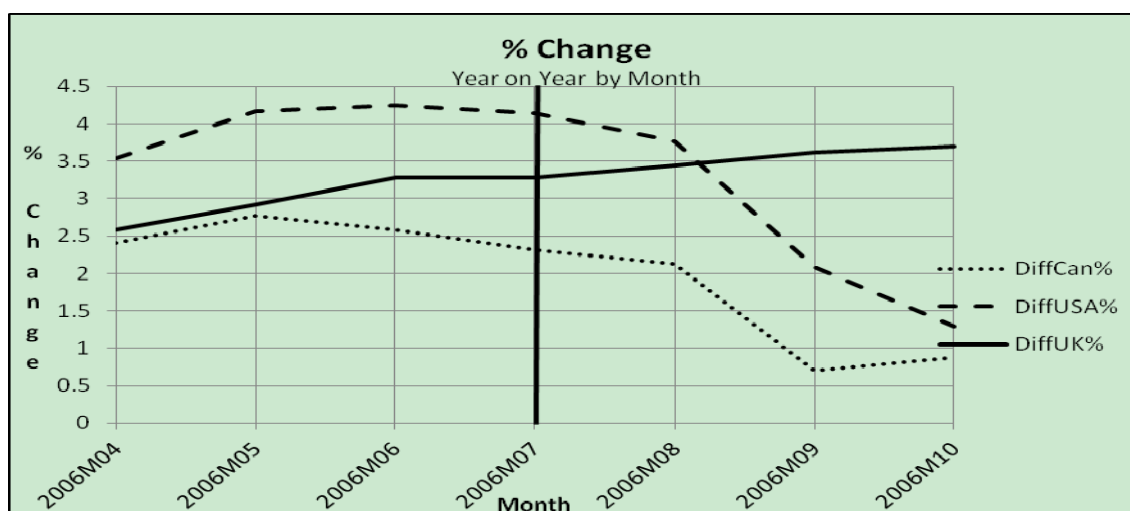
5.3.1 July 2006 Canada decreases GST to 6%

Figure 11. Canada decreases GST to 6% July 2006: CPI change from same month prior year

Tables 11a&b. Canada decreases GST to 6% July 2006: CPI and Statistics

	Apr 2006	May 2006	Jun 2006	Jul 2006	Aug 2006	Sep 2006	Oct 2006
Can	**2.4**	**2.8**	**2.6**	**2.3**	**2.1**	**0.7**	**0.9**
UK	2.6	2.9	3.3	3.3	3.4	3.6	3.7
US	3.5	4.2	4.2	4.1	3.8	2.1	1.3

Statistical Results					
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	-1.245	2.696		-.462	.676
	UK	.625	.706	.462	.886	.441
	US	.316	.481	.689	.658	.558
	Can	**-.645**	**.799**	**-1.004**	**-.808**	**.478**
$R^2 = 0.697$						

When Canada decreased its rate of GST to 6%, there was not significant change in the rate of CPI from June to July. There was a large decrease in CPI two months later, from August to September (from 2.1% to 0.7%). However, one of the control countries, the US, also had a fairly large decrease (from 3.8% to 2.1%) at the same time. Thus, it is not possible to maintain that the decrease in GST caused the change in the rate of inflation.
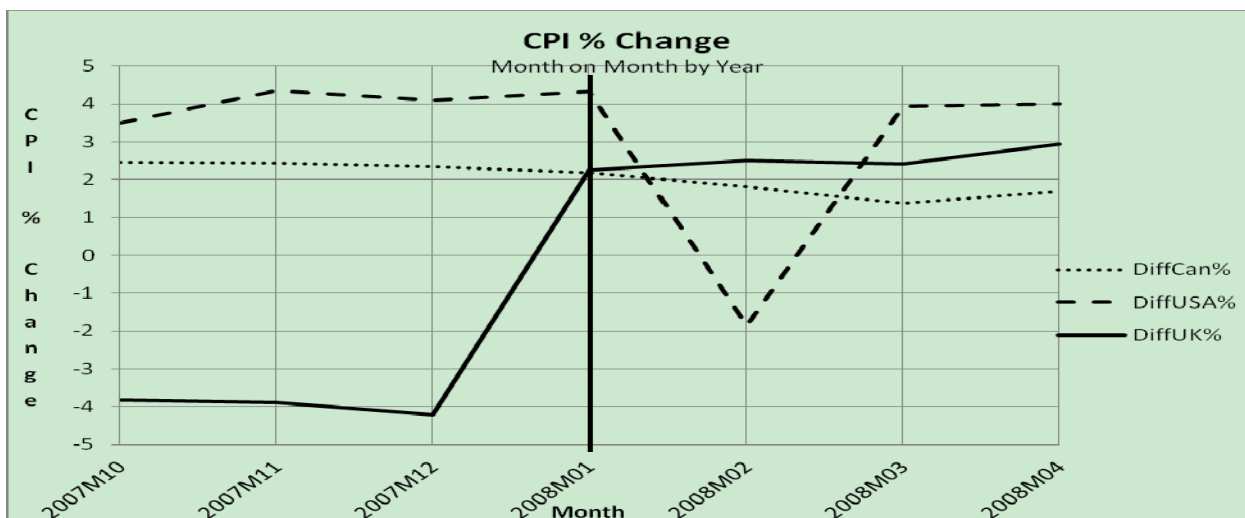
5.3.2 January 2008: Canada reduces GST to 5%

Figure 12. Canada decreases GST to 5% January 2008: CPI change from same month prior year

Tables 12a&b. Canada decreases GST to 5% January 2008: CPI and Statistics

	Oct 2007	Nov 2007	Dec 2007	Jan 2008	Feb 2008	Mar 2008	Apr 2008
Can	**2.5**	**2.4**	**2.4**	**2.2**	**1.8**	**1.4**	**1.7**
US	3.5	4.4	4.1	4.3	-1.9	3.9	4.0
UK	-3.8	-3.9	-4.2	2.3	2.5	2.4	2.9

Statistical Results					
	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	.576	.186		3.097	.053
UK	.155	.011	1.009	14.003	.001
US	4.056E-5	.010	.000	.004	.997
Can	**.017**	**.090**	**.013**	**.189**	**.862**
$R^2 = 0.680$					

The rate of change of CPI in Canada slightly decreased when the rate of GST dropped. However this was part of a general trend of decreasing CPI. The decrease in CPI was not statistically significant. This decrease is continues into the following months. The control countries had very volatile changes. The UK had a highly significant increase that was sustained, whereas the US had a one month drop that was recovered in the following month.

6. Conclusion

This paper described the changes in the Consumer Price Index at the time of introduction of a national multi-stage consumption tax in the UK and Canada and at the time of any rate changes in those countries. The US was used for control purposes, as was the other country with a VAT style tax where there was no change at that time. At the introduction and each change in rate, the analysis show a graph of the change in CPI from the prior year (on an monthly basis) and the results of the statistical analysis.

The results for the introduction of a VAT system are conflicting. The introduction of a VAT in the UK showed no significant effect on the rate of change of CPI, whereas the introduction of GST in Canada did have a significant increase in the rate of CPI. An explanation of the result for the UK is that it could have been driven by the fact that the VAT replaced a fairly hidden consumption tax, the purchase tax. However this explanation is not supported by the results from Canada, where the GST replaced the MST.

In the UK, most of the rate changes seem to have had little effect on inflation. A major exception to this was evidenced most strongly in the new higher rate of 25% for luxuries in May 1975. There was also a significant increase in the rate of CPI in July 1979 when the standard VAT rate was increased to 15% (from 8%). At the same time the higher tax on

luxuries was abolished, effectively raising the rate for those luxury goods from 12.5%. Therefore, all goods and services subject to VAT had an increase and this impacted inflation. These two changes (both of which related to luxury goods, either totally or partially) are the changes that had a effect on inflation.

The UK made a number of changes to the VAT rate over the years. These changes in the VAT rate, either increasing or decreasing, seem not to have had a major impact on inflation in the UK. Any changes in the rate of CPI that were observed were generally part of a continuing trend. Using the US and Canada as controls, strengthens the assertions made. An anomaly was observed when the VAT rate was increased to 17.5% in April 1979. At this time, the rate of CPI decreased in contrast to the expectation that it would have increased. However, since the rate of CPI was the change from the prior year (for the same months), the substantial increase in CPI a year before due to the higher rate (25%) in luxury goods may have had an influence on the observed results.

In Canada, the GST rate decreased in July 2006, dropping to 6% from 7%, and again in January 2008 dropping from 6% to 5%. Neither of these decreases had an impact on inflation in Canada. Part of the reason could be that the decreases were modest especially considering that many of the provinces had their own provincial sales tax.

The results from both the UK and Canada indicate that a major change in VAT rates would have an inflationary impact, whereas a minor change would not.

The question arises of how this paper may shed some light on what may occur if the US decides to implement a National multi-stage Consumption Tax. The assumption would be that any such national VAT- like tax would be in addition to, and not instead of, the federal income tax. Both Canada and the UK added their national consumption taxes to their existing income taxes. Both countries also replaced hidden higher level consumption taxes (Purchase tax in the UK and MST in Canada). If the US introduced a VAT-like system it would not be replacing an existing national consumption tax. Thus, this would be a major change in the US tax system and thus would likely have an inflationary impact.

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