DEPARTMENT OF ECONOMICS
UNIVERSITY OF CYPRUS

THE IMPACT OF THE IRAQ WAR ON US CONSUMER GOODS SALES IN THE ARAB COUNTRIES

Sofronis Clerides, Peter Davis and Antonis Michis

Discussion Paper 2010-06

P.O. Box 20537, 1678 Nicosia, CYPRUS Tel.: ++357-2-892430, Fax: ++357-2-892432
Web site: http://www.econ.ucy.ac.cy

The Impact of the Iraq War on US Consumer Goods Sales in Arab Countries*

Sofronis Clerides† Peter Davis‡ Antonis Michis§

September 2010

Abstract

Did the rise in anti-American sentiment caused by the Iraq war affect sales of US goods abroad? We address this question using data on sales of soft drinks and fabric detergents in nine Arab countries. We find a statistically significant but modest and short-lived negative impact of the war on sales of US soft drinks in some countries but no impact on the sales of detergents in any country. Variation in aggregate market shares of US products across countries correlates with consumer attitudes toward the US in the soft drink market but not in the detergent market.

Keywords: consumer behavior, consumer boycotts, Iraq war.

JEL Classification: D01, D12, L66.

*We thank Iacovos Avraamides for research assistance and the *Nielsen* company for providing the data used in this study. The views expressed in this paper are solely the views of the authors acting in a personal capacity and are, in particular, in no way reviewed or endorsed by any of the institutions for which the authors work.

Correspondence: Sofronis Clerides, Department of Economics, University of Cyprus, P.O.Box 20537, CY-1678 Nicosia, Cyprus. Phone: +357 2289 3709; fax: +357 2289 5028.

†University of Cyprus and CEPR; s.clerides@ucy.ac.cy.

‡UK Competition Commission; peter.davis@cc.gsi.gov.uk.

§Central Bank of Cyprus; AntonisMichis@centralbank.gov.cy.

1 Introduction

The US-led war in Iraq dominated the international political scene from the fall of 2002 to the summer of 2003 and remained in the headlines for several years thereafter. The acrimonious debate over the war's military, legal and ethical justification led to a straining of relations between erstwhile close allies, particularly the United States and France. French objections over the necessity of war led to a rise in anti-French sentiment in the United States. American displeasure toward the French manifested itself in a variety of ways, perhaps most famously in the renaming of french fries as "freedom fries". Less emblematic but potentially more harmful reactions included campaigns calling for boycotts of French products. The effectiveness of these campaigns has been a subject of debate in recent economic research, with one study reporting an estimated drop of 10-12% in bilateral trade between the US and France.[1]

Most directly however, the Iraq war raised anti-US sentiment in many parts of the world, particularly among Arabs. Surveys conducted in six Arab countries (Morocco, Saudi Arabia, Jordan, Lebanon, UAE, Egypt) show that the percentage of Arabs who had an unfavorable opinion of the US increased from 74 to 84 percent between March 2002 and June 2004 (**?**). This average masks considerable variation across countries with a staggering 98% of Egyptians reporting an unfavorable opinion of the US in 2004, up from 76% in 2002. In contrast, citizens of the United Arab Emirates (UAE) show an improved view of the US over this period (from 87% unfavorable in 2002 to 73% in 2004). When respondents in the survey are asked to name the principal factors determining their attitudes towards the US, they overwhelmingly cite the Iraq war and US policy towards the Palestinians.

In this paper we measure the extent to which the rise of anti-US sentiment due to the invasion of Iraq affected the sales of US goods in Arab countries. Boycott campaigns against US products are reported to have been organized in many Arab countries during this period. The campaigns typically targeted iconic American brands such as McDonald's and Coca-Cola but also extended to products that are less symbolic of America, such as cleaning supplies and electronics. Our study focuses on two product categories, soft drinks and laundry detergents. The soft drink category was chosen as the primary focus of our analysis because it includes Coca-Cola and Pepsi, flagship American brands that may be most vulnerable to a boycott campaign relying on anti-American sentiment. In the laundry detergent category the major US producer is Procter & Gamble (P&G), with Colgate having a smaller presence. These companies are probably less high profile as US producers than Coca-Cola or Pepsi. Studying detergents is nonetheless instructive because US producers in this industry face competition from at least two

[1] **?**. We discuss this literature in more detail in the next section.

major European manufacturers in each country. The presence of high quality alternatives makes participation in a boycott more likely.[2] On the other hand, limited availability of substitutes does not rule out the possibility of a successful boycott as long as entry is possible. Indeed, the soft drink category saw a number of new entrants, some of which actively invoked anti-US sentiment during their entry to the market. A prominent example is Mecca Cola, whose senior executive's stated aim was to give the number one US corporation and the Bush administration a "bloody nose".[3]

We test for the impact of the Iraq war using a difference-in-difference approach that compares the evolution of sales of US products vis-a-vis non-US products during the period immediately before and after the beginning of hostilities. Our analysis shows that sales of US soft drinks experienced declines around the time of the Iraq war in some countries but not in others. In three of the nine countries in our data (Bahrain, Egypt, Qatar) we find a statistically significant drop in sales in the three-month period leading up to the war. In Bahrain and Qatar declines (relative to non-US products) are also recorded during the two-month period of hostilities and the three-month period after the end of major combat operations. In the remaining four countries there is no evidence of a negative impact of the war on sales of US soft drinks relative to their non-US competitors. In contrast, we find very little evidence of a decline in the case of US detergent sales, even though it would have been easier for consumers to find high quality alternatives in this case. The implication is that the disutility associated with the consumption of a stigmatized product may be more important than the pure utility loss from not selecting one's optimal product. We explore the issue further using survey evidence of public attitudes toward the United States in several Arab countries. A simple cross-country analysis shows that the level of favorable attitudes toward the United States is positively correlated with the market share of US products in the soft drink market but not in the detergent market, which is consistent with our findings from the Iraq war event study.

Our results suggest that perceptions of firms and countries that are shaped by international political developments can and do affect consumer behavior. In this particular case, the Iraq war had a negative effect on private American firms that can be considered an additional cost of the war that is above and beyond the perhaps unquantifiable, but certainly enormous, burden of the lives lost and damaged on both sides, the financial cost of running the war borne by each

[2]The cost to consumers of participating in a boycott depends on the availability of close substitutes. The easier it is to substitute to a similar product, the smaller the cost, and the higher the probability of a successful boycott campaign. See **?** and **?**.

[3] "We wanted to give a bloody nose directly to the number one corporation [Coca-Cola] that represents corporate America because corporate America represents Bush and Bush represents neo-conservatism." (Rashad Yaqoob quoted in *The Independent* (London, England); Nov. 26, 2003.)

sides' taxpayers and the damage to both physical and human capital in Iraq.[4] But perhaps surprisingly, we do find that the additional 'product-market cost' on US business interests in soft drink and detergent markets is economically modest and short-term in character. Although our conclusions are specific to two consumer goods markets, our results are nonetheless at least a helpful contribution to understanding the wider picture and are perhaps even suggestive as to that wider picture's content as to what the possible effect of the war on wider US economic interests might be.

2 Background

Consumer boycotts and their impact on market outcomes has received considerable attention from economists, political scientists and marketing specialists. **?** defines 'private politics' to be individual or collective action that does not rely on public order (i.e. lawmaking and the courts) through which people attempt to further their interests by imposing their will on others. Efforts by individuals and groups to influence the policies and practices of private firms is one example of such behavior and consumer boycotts are an important tool that is frequently used to that end. Well-known examples include several campaigns against Nike for labor practices in its Asian factories[5] and against Exxon Mobil for its environmental record.[6] Boycotts can also involve government, both as targets and as instigators of boycotts. Several US cities have announced boycotts against the state of Arizona because of its tough new immigration law.[7]

There is a great deal of both policy and academic debate about the effectiveness of boycotts. Economists are generally skeptical because of the free-rider element involved in boycott participation; a consumer may very well prefer that a firm changes a certain practice if this comes at no cost to him, but he may not be willing to participate in a boycott that would limit his choices. There is surprisingly little formal theoretical analysis of boycotts, some recent exceptions being **?**, **?** and **?**. Empirical research is also limited and its findings are "sketchy and inconclusive" (**?**). Some recent work has focused on the boycott campaign undertaken in the US against French wines as a reaction to French opposition to the Iraq war. **?** found evidence of a 13% drop in

[4] **?** provide an estimate of these costs.

[5] A web search for "boycott nike" yields dozens of different calls for boycotts. The site `http://www.viet.net/~nike/` by Vietnam Labor Watch is a good starting point.

[6] "Environmental Groups Launch Exxon Boycott," National Public Radio, July 12, 2005 [`http://www.npr.org/templates/story/story.php?storyId=4749052`].

[7] "In Wake of Immigration Law, Calls for an Economic Boycott of Arizona," *The New York Times*, April 26, 2010; "L.A. Becomes Largest City To Boycott Arizona," CBS, May 12, 2010 [`http://cbs2.com/local/Los.Angeles.City.2.1689109.html`].

French wine sales in the US over the six-month period surrounding the beginning of hostilities. They attributed this decline to the boycott campaigns. **?** have disputed this conclusion claiming that the observed decline was part of a general downward trend in the sales of French wines and was unrelated to the Iraq war. In a broader analysis, **?** find that strained relations between US and France led to a reduction in bilateral trade by a remarkable 10-12%. They also find that much of this reduction was due to reduced trade in firms' inputs. In another case study, **?** find that Chinese boycotts of French products in 2008 led at 25-33% drop in sales of French automobiles.

The international aspect of many of these boycott campaigns brings an interesting dimension to the issue. Are boycotts more effective when an element of patriotism is involved? This question is relevant in foreign policy circles, where experts are interested in the economic impact of US foreign policy on the US itself. One particular debate is over the use of sanctions, which some experts consider to be ineffective but also costly to the US economy (**??**). In one particular study that utilizes a gravity model framework, **?** estimate that in 1995 alone the United States lost $15 to $19 billion worth of exports to countries that were the target of sanctions. In a related study, **?** find that foreign diplomats living in New York City are more likely to break the law (by parking illegally) if they come from a country with negative attitudes toward the US.

It seems plausible that military interventions could have a similar negative impact as sanctions – both types of intervention may be hugely unpopular with at least some subsets of consumers. There is no question that the Iraq war stirred anti-American sentiments across the globe and particularly in the Arab world.[8] Numerous boycott campaigns were organized by individuals and civic groups in many Arab countries. Organizers of such campaigns often provided consumers with lists of European and Asian products they could use as substitutes for US products. Language barriers and distance, both physically and in time, make the collection of quantitative evidence about the number and scale of these boycotts difficult. Nonetheless, we were able to obtain an example of the kind of list that circulated in Saudi Arabia. The list includes a wide range of products and services from US providers: personal hygiene and cleaning supplies, food items and restaurants, clothing, electronics, vehicles and furniture. For each product category the list includes the name of the American brands and a list of substitute products that are of European or Asian origin.[9] Reports of a number of specific boycotts have also appeared in the international press. For example, the UK's *The Guardian* newspaper published a story on January 8, 2003 naming McDonald's, Burger King, Tide and Ariel detergents,

[8] Some survey evidence is presented in section 5.

[9] Our source has asked us not to publish the actual list.

Pampers, Coca-Cola and Pepsi as some of the targets of an Arab boycott.[10] By March 2004, a Coca-Cola director is reported in the *Khaleej Times* as saying "Coca-Cola is looking at a double-digit growth despite tough international and regional competition. And we feel this is achievable as we can see signals of favorable market conditions returning with external factors disappearing."[11] The report claims that "some US companies have reported a drop in sales of between 25 and 40%" and goes on to argue that "factories in Iran making Zam Zam Cola are struggling to keep up with demand for their sweeter version of Pepsi and Coca-Cola. In the United Arab Emirates, sales of the local Star Cola have soared." AME Info, a provider of online business information in and about the Middle East, reported in April 2004 that "in Bahrain, the Al-Montazah supermarket chain [...] boosted sales by pulling about 1,000 US products off its shelves, and other grocers followed suit."[12] Our data can be used to evaluate such statements, some of which contradict each other.

3 Data

Our data were kindly provided by *Nielsen*, the well-known marketing company specializing in consumer goods. We observe prices, sales and distribution of the significant brands in each product category in nine Arab countries (Egypt, Bahrain, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia and UAE). The periodicity is monthly for soft drinks and bimonthly for detergents and the period covered varies across countries, as seen in Table 1. Full details of each of the samples used in the analysis are provided in appendix A.

A total of 25 brands of soft drinks appear in our data.[13] Fourteen of those are US brands distributed by the Coca Cola (CCI) and Pepsi Cola (PCI) corporations. In addition, there were categories "Other PCI brands" and "Other CCI brands" reported in the data. We dropped these other brands from the study as their sales were trivial.[14] There is also one major European distributor, Cadbury-Schweppes. The major regional producer is Al-ahram Beverages Company (ABC) which is originally an Egyptian firm that was taken over by Heineken (a European firm) in September 2002. ABC was the state monopoly prior to 1997 but was subsequently privatized.

[10] "Arab boycott of American consumer goods spreads," *The Guardian*, January 8, 2003.

[11] Gurtay Kipcak, Public Affairs and Communications Director, Eurasia and Middle East Division of Coca-Cola, cited in "Coca-Cola launches new drink in UAE," *Khaleej Times*, March 24, 2004.

[12] "Coke and Pepsi battle it out," `http://www.ameinfo.com/37492.html`, April 8, 2004.

[13] Table 10 in appendix A reports all the brands, together with their country of origin.

[14] Average (across periods and countries) sales of "other CCI brands" were 0.28 thousand 8oz bottles while average sales of other PCI brands were 0.01 thousand 8oz bottles. These compare to average sales of CCI's flagship Coca Cola brand of 467 thousand 8oz bottles.

Table 1: Period covered by data for each country and product

Country	Soft Drinks	Detergents
Bahrain	Jan. 2002 - Dec. 2005	Jan/Feb 2002 - Jan/Feb 2005
Egypt	Jan. 2002 - Mar. 2005	Jan/Feb 2002 - May/Jun 2004
Jordan	Jan. 2002 - Dec. 2005	Jan/Feb 2002 - Mar/Apr 2005
Kuwait	Jan. 2002 - Dec. 2005	Jan/Feb 2002 - Jan/Feb 2005
Lebanon	Jan. 2001 - Jun. 2006	Jan/Feb 2002 - Nov/Dec 2005
Oman	Jan. 2001 - Jul. 2006	Jan/Feb 2002 - Jan/Feb 2005
Qatar	Jan. 2002 - Dec. 2005	Jan/Feb 2002 - Jan/Feb 2005
S. Arabia	Jan. 2002 - Jun. 2005	Jan/Feb 2002 - Nov/Dec 2005
UAE	Jan. 2002 - Dec. 2005	Jan/Feb 2002 - Jul/Aug 2005

Note: major hostilities in Iraq took place in March-April 2003.

ABC's brands mainly have a presence in Egypt with the exception of Everness, which also sells in Oman, Qatar and the UAE. Table 2 provides summary statistics for soft drinks. Saudi Arabia is by far the biggest market, more than twice as big as second-ranked Egypt. Prices are not comparable across countries because they are denoted in local currencies. The distribution variable measures the percentage of outlets (weighted by sales) carrying each brand.

Table 2: Summary statistics for soft drinks by country

	Quantity		Price		Weighted distribution	
Country	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Bahrain	69.1	120	247.7	120.3	61.8	36.3
Egypt	571.4	801.5	3.0	1.6	32.5	34.3
Jordan	220.8	354.4	0.5	0.3	47.6	36.2
Kuwait	246.8	406.3	0.2	0.1	65.1	34.5
Lebanon	231.2	346.2	1,275.3	639.5	50.3	35.7
Oman	119.1	178.1	206	106.2	69.6	38.9
Qatar	56.9	98.1	2.8	2.0	62.9	39.7
S. Arabia	1,222.3	1,828.4	2.8	1.4	64.4	34
UAE	254.2	425.7	239.2	123.8	62.1	39.2

Note: averages are taken across brands and time-periods and prices are measured in local currency units. Quantities are measured in thousands of 8oz containers.

A limitation of the dataset is that it lumps sales of all small brands together in an "Others" category and as a result we cannot track the success of individual small brands that were launched to take advantage of the boycott. Mecca Cola appears in the *Nielsen* data we use only in Qatar in 2003-2005. It also launched in France in November 2002 and in Britain in January

2004.[15] A second entrant, Arabian Cola, appears in the data only in Oman for the period 2002m8 to 2003m1 during which it records an unimpressive total sales volume of 1,500 8-oz bottle equivalents. A third entrant, Qibla Cola, does not appear in the data but was launched in the UK in 2003 and has subsequently entered a number of territories around the world, selling to countries including UK, Netherlands, Norway, Canada, Libya, Pakistan from April 2004 and Malaysia from March 2005.[16]

The fabric detergent market is less concentrated than the soft drinks market and features a number of small local brands and manufacturers.[17] There are two major American manufacturers, P&G and Colgate. The first is the market leader in almost all the countries in our dataset. Its two main competitors are the European manufacturers Unilever and Henkel. There are also a considerable number of local manufacturers, some of whom operate in more than one country. Another characteristic of our detergents sample is the varying number of brands found in each country. Table 3 provides summary statistics for each country. Egypt has the largest sales of detergents while Saudi Arabia has the largest sales in our soft drinks dataset.

Table 3: Summary statistics for detergents by country

	Quantity		Price		Weighted distribution	
Country	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Bahrain	29.1	54.8	675.1	418.6	43.9	33.5
Egypt	2,613.7	3,619.9	4.6	2.9	33.5	28.1
Jordan	182.7	320.3	1.3	0.9	42.6	34.9
Kuwait	10	15.5	7.2	4.3	49.0	39.2
Lebanon	9.6	19.9	36,430.8	36,893.8	29.3	34.5
Oman	4.4	8.3	15241.8	49,787.2	38.5	34.2
Qatar	2.6	3.5	114.6	270.1	55.4	39.0
S. Arabia	774.3	1,398.7	5.9	2.8	47.4	35.0
UAE	9.3	20.0	18,784.5	44,890.1	31.8	36.1

Note: averages are taken across brands and time-periods and prices are measured in local currency units. Quantities are measured in thousands of kilograms.

[15] "Goodbye, Coke. Hello, Mecca Cola," *The Washington Post*, April 20, 2003.

[16] The company went into receivership in the UK in September 2005. Wikipedia reports that it continues to operate in some countries but we have been unable to confirm this. Records from the Internet Archive (`http://www.archive.org`) indicate that the company's website (`http://www.qibla-cola.com`) was live until 2008.

[17] A list of all brands in the data is provided in Table 11 in appendix A.

4 Empirical analysis

This section presents the evidence on the impact of the Iraq war on sales of US soft drinks and detergents in the nine Arab countries in our data. We first present descriptive and graphical evidence and then move to a more formal econometric analysis.

4.1 Descriptive evidence

Major combat operations in Iraq began in March 2003 and ceased in May 2003. If there was an impact on sales of US products, we would expect it to show up in annual sales figures for the year 2003. Table 4 reports growth rates of sales of US and non-US products in each country over several different periods. Annual sales of US products declined in 2003 relative to the previous year in five of the nine countries in our sample. On the other hand, sales of non-US products increased in all nine countries. In 2003, the (unweighted) average growth over all countries was 2.1% for US products and 23.3% for non-US products. By contrast, in 2004 and 2005 the sales growth of US products was somewhat higher than that of non-US products in almost all countries. Note however that these growth rates are relative to the low sales levels of 2003. During the two-year period 2002-2004, sales of non-US products grew much faster than those of US products in seven out of nine countries. The overall picture emerging from Table 4 is that sales of US products were negatively impacted in 2003 but returned to "normal" growth rates in 2004. We cannot of course say from this table alone whether sales eventually return to the levels they would have attained in the counterfactual world of no war.

For a more detailed look at the temporal evolution of sales we turn to a graphical depiction of the data. Figure 1 plots 12-month growth rates of monthly sales of US and non-US soft drink products; that is, it compares sales in each month to sales of the same month the previous year. This is different from the growth rates reported in Table 4, which measure the growth of annual sales. Focusing on monthly 12-month growth rates means that we are able to make a comparison between the same month in different years, the simplest and most transparent way of controlling for seasonality. The vertical line on each plot marks the beginning of hostilities in Iraq (March 2003). It can be seen that the sales growth rate of US products at the time of the war is slower than that of non-US products in every single country and is in fact negative in all but one of them. The exception is Kuwait, where sales of US products grow consistently throughout 2002-03. Sales of US soft drinks begin showing positive growth rates in almost all countries sometime in the post-war period. Comparing the sales growth of US and non-US products, there is generally a divergence in the rate of growth during hostilities followed by

Table 4: Sales growth rates of soft drinks

	Growth rates in yearly sales between:				
	2002-2003	2003-2004	2004-2005	2002-2004	2002-2005
US products					
Bahrain	-7.9	15.3	7.2	6.2	13.9
Egypt	10.9	4.0		15.3	
Jordan	-8.1	20.3	23.2	10.6	36.2
Kuwait	19.7	6.6	18.8	27.5	51.6
Lebanon	0.8	4.6	-0.5	5.5	5.0
Oman	-5.3	15.0	7.6	8.9	17.1
Qatar	12.1	26.1	29.8	41.4	83.6
S. Arabia	-2.2	7.4		5.0	
UAE	-1.6	25.6	6.0	23.6	31.1
Mean	2.1	13.9	13.2	16.0	34.1
Non-US products					
Bahrain	6.0	-3.8	6.6	1.9	8.7
Egypt	11.0	-4.3		6.2	
Jordan	62.8	32.6	18.0	115.9	154.9
Kuwait	43.1	14.2	15.3	63.4	88.3
Lebanon	12.1	5.7	1.7	18.5	20.5
Oman	16.3	13.2	2.7	31.6	35.2
Qatar	37.7	33.5	19.1	83.9	119.0
S. Arabia	11.4	2.7		14.3	
UAE	9.3	27.1	-3.1	38.9	34.6
Mean	23.3	13.4	8.6	41.6	65.9

a gradual convergence in the post-war period. Overall, we see Figure 1 as providing strong evidence that the war had a negative impact on US sales and a positive impact on non-US sales, but that the effect was short-lived.

We repeat the descriptive analysis for the fabric detergent product category. Table 5 reports annual growth rates and paints a very different picture than the case of soft drinks. Growth rates for US products were positive in 2003 in all countries except Kuwait, where it was slightly negative. By contrast, non-US products experienced negative growth in three countries. US products do even better in 2004, when they grow by an average rate of 5.6% whereas non-US products lose 2.7% of sales. Between 2002 and 2004, US product sales grow faster in six of the eight countries for which growth rates can be calculated. Overall, there is no evidence of a decline in sales for US products in 2003. To sustain a story which suggested the boycott was

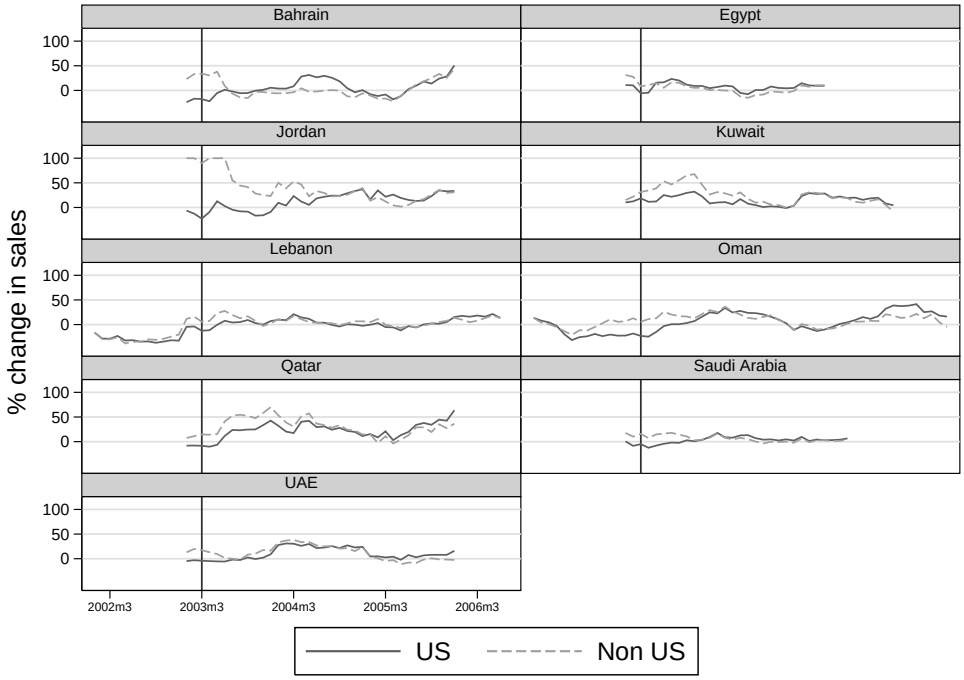

Figure 1: Percentage change in sales of US and non-US soft drinks in each month compared to the same month the previous year. In the case of Jordan percentage changes exceeding 100% were marked as 100% in order to keep the scale reasonable. The vertical line denotes the start of hostilities in Iraq.

effective one would have to argue that US products' superior performance in 2004 (relative to non-US products) indicates that sales in 2003 might have grown even faster were it not for the war. Such a position is quite difficult to reconcile with (for example) almost 20% growth rates in US sales in 2002/03 in Lebanon and Oman.

Figure 2 is the equivalent of Figure 1 for detergent products. It plots growth rates for each two-month period relative to the same period one year earlier ("MA2003" stands for March-April 2003). Sales of US products grew faster than those of non-US products around the time of the war in five out of the nine countries; these are the same countries that show higher annual growth rates for non-US products in Table 5. In four of the five countries (Kuwait, Qatar, Saudi Arabia and the UAE) there is evidence of a reversal as growth rates of US products overtake those of non-US products a few months after the war and remain higher thereafter. In Jordan the growth rates of US products drop significantly starting in January-February 2003 and start recovering about six months after the war. The evidence is not as strong as in the case of soft drinks, but there is enough action in the data in at least five countries to warrant further

Table 5: Sales growth rates of detergents

	Growth rates in yearly sales between:				
	2002-2003	2003-2004	2004-2005	2002-2004	2002-2005
US products					
Bahrain	3.5	10.4		14.3	
Egypt	4.4				
Jordan	2.4	9.3		11.9	
Kuwait	-0.9	2.6		1.7	
Lebanon	18.2	-3.8	7.0	13.7	21.7
Oman	19.2	8.0		28.7	
Qatar	0.4	-2.6		-2.3	
Saudi Arabia	8.6	14.3	7.2	24.1	33.0
UAE	8.5	6.6		15.7	
Mean	7.1	5.6	7.1	13.5	27.4
Non-US products					
Bahrain	-4.4	-7.7		-11.8	
Egypt	6.6				
Jordan	-3.5	-2.8		-6.2	
Kuwait	21.7	1.6		23.7	
Lebanon	14.1	-1.9	0.6	11.9	12.6
Oman	-6.3	-5.7		-11.6	
Qatar	5.5	1.5		7.1	
Saudi Arabia	13.6	-1.0	-6.3	12.5	5.4
UAE	11.5	-5.7		5.1	
Mean	6.5	-2.7	-2.8	3.8	9.0

investigation.

4.2 Econometric analysis

A straightforward method for estimating the impact of the war on US sales is to implement a difference-in-difference approach, using non-US sales as the "control" group. Clearly, non-US products are not a "control" group in the standard sense since their sales may very well be affected, probably in a positive direction, by the treatment (the war). Even so the data variation is useful to test the hypothesis of a differential effect on the two types of products.

Let Q_{jct} denote the quantity (volume) of sales of brand j in country c at time (month) t. We define the variable War_t as a dummy variable equal to one for the months March and April

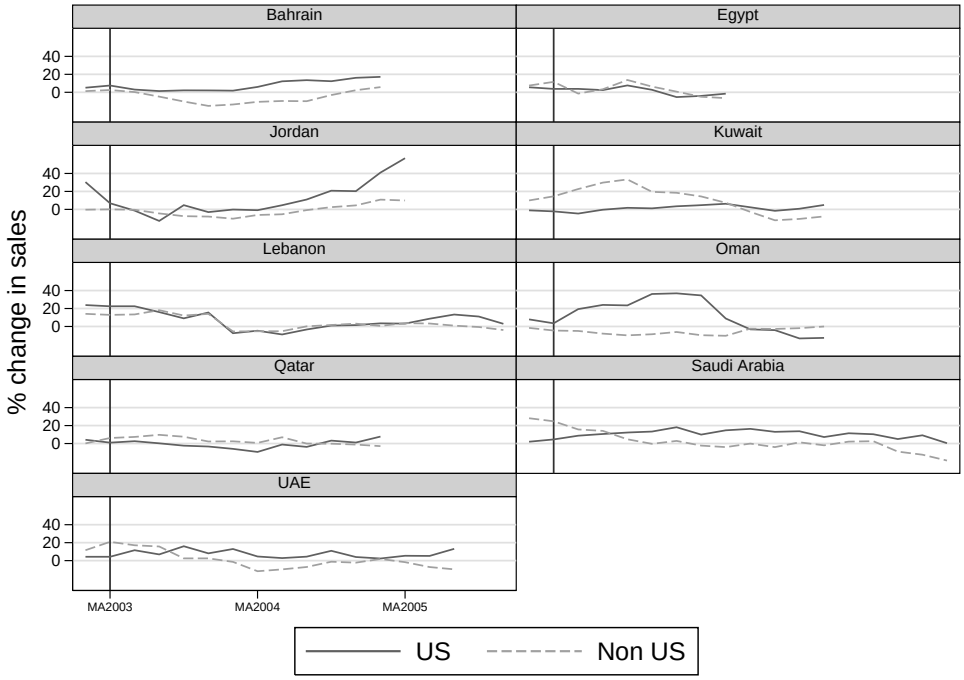

Figure 2: Percentage change in sales of US and non-US fabric detergents in each month compared to the same month the previous year. The vertical line denotes the start of hostilities in Iraq.

of 2003. Recall that hostilities began on March 20th 2003 and President Bush declared the end of major combat operations on May 1st 2003. We define the dummy variables $Prewar_t$ and $Postwar_t$ to take the value of one for the three months prior to the beginning and after the end respectively of major combat operations. We estimate the following specification using the natural log of sales, $\ln Q_{jct}$, as the dependent variable:

$$\ln Q_{jct} = \alpha_{jc} + \tau_{ct} + \theta_{1c}\left(US_j * PreWar_t\right) + \theta_{2c}\left(US_j * War_t\right) + \theta_{3c}\left(US_j * PostWar_t\right) + \varepsilon_{jct} \quad (1)$$

where α_{jc} are fixed effects for each brand-country pair, τ_{ct} are country specific time fixed effects, $\theta_c = (\theta_{1c}, \theta_{2c}, \theta_{3c})$ are the country-specific coefficients of interest and ε_{jct} are the error terms. We repeat the exercise using two alternative dependent variables, log prices and log weighted distribution (with the latter not reported). As a robustness check, we add log price to the log sales specification to account for possible movement in sales caused by price adjustments.

In this formulation of the regression equation, the fact that we do not pool the data across countries means that all the parameters are country specific and our estimates only use within

country data variation. For a given country the presence of brand (country) fixed effects then means that the estimates are "within brand" in the sense that they allow for brand specific fixed effects. The estimates then use variation across brands and time (within country) to identify (θ_{1c}, θ_{2c}, θ_{3c}). The country-time fixed effects control for shocks that might affect sales of all products within each product category in the same way, such as seasonality in demand (demand for soft drinks tends to be higher during the summer months). The coefficients on the interaction terms, US*PreWar, US*War and US*PostWar are therefore identified using within-country data variation, controlling for brand-and-time-specific variation. They respectively capture the effect of the war on sales of US products relative to non-US products during the PreWar, War and PostWar periods.[18]

The specification in equation (1) aims to capture the difference between sales growth rates for US and non-US products like those reported in Tables 4 and 5 and displayed in Figures 1 and 2, although there are some differences between them. The tables report changes in annual sales while the figures and the econometric analysis use 12-month growth rates. The latter are better suited for capturing short-term effects. Also, the tables and figures report changes in aggregate (over brands) sales of US and non-US products, while the econometrics capture the average impact on US versus non-US brands. This average may mask a differential impact across brands.

We estimated the model separately for each country and for each product category. The results of estimating equation (1) for soft drinks are reported in the first panel of Table 6, under the heading "Sales". For brevity we display only the coefficients of primary interest, namely θ_{1c}, θ_{2c} and θ_{3c}. We see evidence of a statistically significant drop (at the 10% level or better in at least one of the three periods we test for) in sales of US products in four of the nine countries (Bahrain, Egypt, Oman, Qatar). In two other countries (Jordan and Lebanon) coefficients are negative and quite large but not statistically significant. In Kuwait, Saudi Arabia and the UAE we obtain mostly positive coefficients, with only one of them being statistically significant (for the pre-war period in the UAE).

Prices may be a confounding factor in this analysis. If prices adjusted downward in response to a drop in demand for US products, this would tend to dampen the estimated impact on sales. In order to test for the possible role of prices, we first look for an impact on relative prices by estimating a similar specification to (1), but using price instead of sales as the dependent

[18] An alternative approach would have been to estimate an equation that includes time fixed effects that are specific to US and non-US products and to examine how the two sets of estimates behave during the period of interest.

Table 6: Estimates of equations (1)-(3) for the soft drinks product category

	Egypt	Bahrain	Jordan	Kuwait	Lebanon	Oman	Qatar	S. Arabia	UAE
Sales									
US_prewar	-0.284 *	-0.291 *	-0.494	0.354	-0.185	-0.029	-0.258 *	0.007	0.328 +
	(0.090)	(0.120)	(0.384)	(0.235)	(0.370)	(0.104)	(0.101)	(0.126)	(0.180)
US_war	-0.258 *	-0.258 *	-0.175	0.173	-0.15	-0.108 +	-0.54 *	0.091	0.131
	(0.098)	(0.115)	(0.404)	(0.253)	(0.455)	(0.057)	(0.166)	(0.109)	(0.249)
US_postwar	-0.122 +	-0.204 +	0.243	0.305	-0.518	-0.509 *	-0.427 *	-0.003	-0.075
	(0.067)	(0.114)	(0.450)	(0.249)	(0.370)	(0.259)	(0.129)	(0.090)	(0.220)
R-squared	0.976	0.845	0.821	0.925	0.813	0.841	0.904	0.92	0.887
N	740	690	578	549	594	702	586	525	694
Price									
	Egypt	Bahrain	Jordan	Kuwait	Lebanon	Oman	Qatar	S. Arabia	UAE
US_prewar	0.045 *	-0.005	0.035	-0.021	0.186 +	0.118 *	0.041 *	0.001	-0.021
	(0.016)	(0.012)	(0.048)	(0.022)	(0.096)	(0.041)	(0.013)	(0.022)	(0.026)
US_war	0.061 *	-0.016	0.042	-0.009	0.145	0.101 *	0.059 *	-0.004	-0.04 *
	(0.016)	(0.010)	(0.056)	(0.026)	(0.143)	(0.050)	(0.021)	(0.027)	(0.019)
US_postwar	0.048 *	-0.031 *	0.006	-0.024	0.214 +	0.127 *	0.036 *	-0.002	-0.047 *
	(0.014)	(0.009)	(0.048)	(0.024)	(0.113)	(0.046)	(0.012)	(0.020)	(0.012)
R-squared	0.953	0.938	0.859	0.949	0.598	0.569	0.851	0.962	0.932
N	740	690	579	549	594	702	586	525	694
Sales, controlling for Price									
	Egypt	Bahrain	Jordan	Kuwait	Lebanon	Oman	Qatar	S. Arabia	UAE
lnp	-2.373 *	-2.843 *	-3.299 *	-4.736 *	-2.774 *	-3.381 *	-2.563 *	0.237	-1.98
	(0.377)	(1.103)	(0.518)	(0.661)	(0.509)	(0.651)	(0.402)	(1.056)	(1.983)
US_prewar	-0.177 *	-0.305 *	-0.378	0.253	0.332	0.369 *	-0.153 +	0.007	0.286
	(0.089)	(0.101)	(0.389)	(0.166)	(0.266)	(0.154)	(0.081)	(0.122)	(0.196)
US_war	-0.112	-0.303 *	-0.053	0.129	0.251	0.233	-0.39 *	0.092	0.051
	(0.089)	(0.105)	(0.431)	(0.160)	(0.349)	(0.175)	(0.138)	(0.106)	(0.271)
US_postwar	-0.007	-0.291 *	0.261	0.192	0.076	-0.08	-0.336 *	-0.003	-0.168
	(0.065)	(0.126)	(0.409)	(0.169)	(0.348)	(0.233)	(0.120)	(0.089)	(0.248)
R-squared	0.979	0.852	0.839	0.946	0.845	0.874	0.918	0.92	0.889
N	740	690	578	549	594	702	586	525	694

+ p<0.10, * p<0.05 All regressions include brand and time fixed effects and are estimated separately for each country. Robust standard errors in parentheses.

variable:

$$\ln P_{jct} = \alpha_{jc} + \tau_{ct} + \theta_{1c}\left(US_j * PreWar_t\right) + \theta_{2c}\left(US_j * War_t\right) + \theta_{3c}\left(US_j * PostWar_t\right) + \varepsilon_{jct} \quad (2)$$

The results are reported in the second panel of Table 6, under the heading "Price". We only pick up a significant drop in US prices (relative to non-US) in the UAE and to a lesser extent in Bahrain. Interestingly, we pick up an *increase* in relative prices in four countries (Egypt, Lebanon, Oman and Qatar), with the increase in Lebanon and Oman being in the double digits in each of the three periods. One reason to expect apparent price increases would be if relatively low-price stores sold fewer US products during the first half of 2003. If so, then the resulting change in composition of selling prices across stores would appear as a positive pricing response in this regression. Given these findings, it seems important to add controls for prices in specification (1). We therefore re-estimated equation (1) with the addition of log price as an explanatory variable:

$$\ln Q_{jct} = \alpha_{jc} + \tau_{ct} + \gamma \ln P_{jct} + \theta_{1c}\left(US_j * PreWar_t\right) + \theta_{2c}\left(US_j * War_t\right) + \theta_{3c}\left(US_j * PostWar_t\right) + \varepsilon_{jct} \quad (3)$$

This equation may be thought to represent a demand relationship. However we prefer not to give it this structural interpretation primarily because we do not need to and also because it would be a stretch to claim that we were estimating structural parameters rather than reduced form parameters from this equation. There are at least three reasons for this: (i) changes in observed prices may reflect changes in availability of products at stores with different prices, rather than actual price changes; (ii) generally we would expect the demand for any brand to at least potentially depend on rival brand prices, which are not included in equation (2); and (iii) prices may be correlated with the error term and thus would need to be treated as endogenous variables;[19] The results are reported in the third panel of Table 6 under the heading "Sales, controlling for price". Relative to the estimates from equation (1) reported in the top panel, coefficients move in the expected direction. They become smaller in the case of the UAE and Bahrain and larger in the case of Egypt, Lebanon, Oman and Qatar. The coefficients on price look entirely plausible if one were willing to interpret them as elasticities. The only substantive change is in the case Oman where the estimated negative impact disappears, even becoming positive and significant in the pre-war period. In Egypt, Bahrain and Qatar we still have a significant negative impact in at least one of the periods we test for.

[19]That said, as is commonly the case with data from supermarkets where promotions provide a significant amount of the variation in price data, there appears little evidence of endogeneity of prices and we do indeed estimate a relationship between quantity and price that slopes downward.

Table 7: Estimates of equations (1)-(3) for the laundry detergents product category

Sales

	Egypt	Bahrain	Jordan	Kuwait	Lebanon	Oman	Qatar	S. Arabia	UAE
US_prewar	0.085	-0.161	0.169	-0.249	-0.085	0.269	-0.714	-0.131	-0.89 *
	(0.089)	(0.383)	(0.529)	(0.269)	(0.533)	(0.346)	(0.476)	(0.387)	(0.326)
US_war	0.38	-1.362	-0.541	-1.814	0.276	-0.423	-0.077	-0.427	-0.786
	(0.318)	(1.412)	(0.555)	(1.333)	(0.582)	(0.736)	(0.493)	(0.265)	(0.644)
US_postwar	-0.228	-0.461 +	-0.551 +	-0.044	0.261	0.211	0.199	-0.289	-0.553 *
	(0.202)	(0.259)	(0.297)	(0.264)	(0.463)	(0.230)	(0.255)	(0.195)	(0.275)
R-squared	0.976	0.82	0.772	0.932	0.86	0.93	0.937	0.946	0.939
N	144	295	239	269	477	374	239	324	495

Price

	Egypt	Bahrain	Jordan	Kuwait	Lebanon	Oman	Qatar	S. Arabia	UAE
US_prewar	-0.025	0.051	0.206 *	0.146 *	0.089	0.079 *	0.146 *	0.073 *	0.049
	(0.015)	(0.039)	(0.097)	(0.049)	(0.060)	(0.034)	(0.067)	(0.014)	(0.076)
US_war	-0.019	0.1	0.253 +	0.128 *	0.137	0.066	-0.102	0.058 *	-0.242
	(0.018)	(0.066)	(0.146)	(0.048)	(0.088)	(0.040)	(0.211)	(0.022)	(0.332)
US_postwar	-0.013	0.07 +	0.279 +	0.087 *	0.128 +	0.065 +	-0.123	0.023	-0.166
	(0.017)	(0.041)	(0.152)	(0.039)	(0.073)	(0.033)	(0.121)	(0.016)	(0.156)
R-squared	0.985	0.839	0.641	0.919	0.706	0.965	0.845	0.965	0.886
N	144	295	239	269	479	378	240	324	495

Sales, controlling for Price

	Egypt	Bahrain	Jordan	Kuwait	Lebanon	Oman	Qatar	S. Arabia	UAE
lnp	-0.695	-2.202 *	-1.911 *	0.029	-0.709 *	-1.424 *	-1.953 *	-2.397 +	-1.153 *
	(1.224)	(0.557)	(0.296)	(0.405)	(0.265)	(0.283)	(0.514)	(1.248)	(0.189)
US_prewar	0.068	-0.05	0.564	-0.253	-0.022	0.397	-0.429	0.045	-0.834
	(0.104)	(0.366)	(0.566)	(0.274)	(0.514)	(0.324)	(0.387)	(0.377)	(0.340)
US_war	0.367	-1.141	-0.058	-1.818	0.374	-0.302	-0.277	-0.289	-1.065
	(0.331)	(1.324)	(0.478)	(1.346)	(0.549)	(0.723)	(0.481)	(0.256)	(0.519)
US_postwar	-0.237	-0.306	-0.019	-0.047	0.352	0.319	-0.041	-0.232	-0.744
	(0.208)	(0.259)	(0.282)	(0.264)	(0.433)	(0.222)	(0.244)	(0.192)	(0.258)
R-squared	0.976	0.836	0.799	0.932	0.864	0.933	0.956	0.947	0.947
N	144	295	239	269	477	372	239	324	495

+ p<0.10, * p<0.05 All regressions include brand and time fixed effects and are estimated separately for each country. Robust standard errors in parentheses.

The econometric exercise was repeated for the case of detergent products. As we argued in the introduction, detergents provide an interesting complement to the soft drink study because in addition to the one large US producer, P&G, there are two large European firms, Henkel and Unilever, with a significant presence in each of the countries in our study. In addition there are a number of smaller but still sizable other firms. A campaign to boycott US products might reasonably expect to be successful in the detergents category because the cost of switching to alternative products is likely to be small.[20] Since our detergent data are bimonthly, we define $Prewar_t$ as JF2003 and $Postwar_t$ as MJ2003. The estimates presented in Table 7 show very weak evidence of a drop in sales of US goods. In the top panel we see a significant impact in the UAE in the pre-war and post-war period an in Bahrain and Jordan in the post-war period. But even these coefficients become statistically insignificant once we control for prices in the bottom panel. We conclude that there is no evidence of an impact of the war on sales of US detergents, but with the caveat that this conclusion is based on a sparser dataset than the corresponding one for soft drinks.

The evidence presented in this section suggests that the Iraq war had a negative impact on the sales of some US products but the impact was by no means universal. The descriptive and graphical evidence indicate a negative impact on soft drinks sales in almost all countries, but formal econometric analysis picks up statistically significant differential effects in only three countries: Bahrain, Egypt and Qatar. In the case of detergents the descriptive evidence is weaker and no statistically significant effects are found. An interesting aspect of these results is that consumer boycotts appear to have been more effective in the market where there are fewer branded alternatives (soft drinks). This is likely to be due to the status of brands such as Coke and Pepsi as iconic American products. Our estimates are consistent with media reports suggesting that the Iraq war hurt American companies but that the impact was relatively limited.[21] They also in line with other recent work showing that international politics can influence consumer behavior. It should be noted, however, that the impact of political events in our study is qualitatively much smaller than the estimates reported in some other studies.[22]

An instructive contrast can be made with the case of the boycott of Danish products after the publication of cartoons that were considered offensive to Muslims in a Danish newspaper in 2005. The boycott attracted significant retailer participation. From January to early April

[20] On the other hand, it may be hard for others to observe individuals cheating and so informal mechanisms to monitor compliance are harder to use in order to avoid individuals free riding.

[21] One such report states: "Still, damage from last year's invasion of Iraq could have been worse, says Carline Levy, UBS's beverage analyst in New York. 'We thought there would be a big backlash," she says. "It's been less negative than anyone worried,'" from "Coke and Pepsi battle it out," AMEInfo, April 8, 2004 [`http://www.ameinfo.com/37492.html`].

[22] See, for example, **?** and **?**.

Table 8: Opinions of America in the Arab world

	Zogby International			PewResearchCenter			
Country	2002	2004	2005	2002	2003	2004	2005
Saudi Arabia	12	4	9				
Jordan	34	15	33	25	1	5	21
Lebanon	26	20	32	35	27		42
UAE	11	14	21				
Egypt	15	2	14				
Morocco	38	11	34		27	27	

Source: **??** and **?**. The numbers reported are the percentages of those surveyed who stated that they hold a favorable view of the US. Our market dataset does not cover Morocco but we included it in the table as it is an Arab country.

of 2006 several major retailers withdraw Danish dairy products from their shelves. As a result, sales of these products during that period "came to a standstill".[23] We found no evidence of similar retailer activism in relation to the Iraq war and this might explain the limited impact of boycott campaigns in our case study.

5 The impact of attitudes

Next we explore whether cross-country variation in attitudes toward the US is consistent with our findings in the previous section. Survey evidence suggests that attitudes toward the United States in Arab countries worsened in the run-up to, and following, the Iraq war. Table 8 reports the findings of surveys carried out by Zogby International and the PewResearchCenter during the 2002-2005 period covered by our data. The proportion of people with positive opinions of the US dropped substantially between 2002 and 2004 in five of the six countries (UAE is the exception), but that trend exhibits a notable reversal in most countries in 2005.

We would like to relate these attitudinal variables to sales of US goods. A natural approach would be to incorporate the attitudinal variables into the empirical specification we employed in the previous section. This is not possible as surveys are only available yearly and our empirical model incorporates a full set of country-specific time dummy variables. If monthly opinion survey data by country were available, we could - for example - directly explore the relationship between the country-time specific fixed effects estimated in the model above and the attitudinal variables. Since this is not possible – and while recognizing the limitations of our data – we

[23]Quote from an executive of the Danish dairy group Arla Foods, reported in "Arla dairy sales crippled by Middle East boycott," Dairy Reporter, January 31, 2006 [`http://www.dairyreporter.com/Financial/Arla-dairy-sales-crippled-by-Middle-East-boycott`].

specify a simple model of the annual share of US products in a given country as a function of two variables: the natural logarithm of real GDP per capita (INCOME) and the percentage of people in the country with a favorable opinion of the US (FAVORABLE). We assume that the opinions recorded in surveys are representative of the entire year, even though the surveys were conducted over a much shorter period (no more than a month). Doing so gives us observations for two years in five countries. We supplement the Zogby international data with additional survey evidence from the Pew Global Attitudes Project which was conducted in 2003 and 2005 (**?**). The Pew data reports the extent of favorable opinion about the US in two of the countries in our study, Jordan and Lebanon. Incorporating this information gives us four more observations on soft drinks and two on detergents (for detergents our sample does not extend to 2005) for a total of 15 and 10 respectively. With these admittedly limited data we estimated the following simple model:

$$Q_{ct}^{US}/Q_{ct}^{Total} = \alpha + \beta \cdot INCOME_{ct} + \phi \cdot FAVORABLE_{ct} + \varepsilon_{ct}. \tag{4}$$

The model was estimated using OLS with standard errors computed allowing for correlation among the error terms of observations belonging to the same country. The results are presented in Table 9. Even with only 15 observations, the coefficient ϕ is estimated quite precisely (p-value = .061) and has the expected positive sign in the case of soft drinks. Per capita income is also positive as one might have expected and significant at the 5% level. The results suggest that a 10% drop in the percentage of favorable opinions toward the US would lead to a .0258 percentage point drop in the share of US sales in total, which is equivalent to $43.3 million of foregone annual revenue. This amount is small, at least when compared to the $1.7 billion annual revenue from soft drinks by US corporations in this region. Note that this is only true in the soft drink market. In the case of detergents the coefficient ϕ is imprecisely estimated, even though the coefficient β is. This is consistent with results from the previous section that showed no impact of the Iraq war on US detergent sales even though soft drinks were affected.

6 Conclusions

The cost of the Iraq war has been a cause of much debate in the United States, partly because measuring its full economic cost is tremendously difficult. It is however widely recognized that a calculation of the full economic cost of the war should include a measure of foregone profits for US companies that result from worsening attitudes toward the United States. Our study provides evidence on the magnitude of these costs by analyzing the impact of the Iraq war on

Table 9: Estimates of equation (4).

	Soft drinks		Detergents	
INCOME	.023*	(.009)	.128†	(.055)
FAVORABLE	.258†	(.125)	.457	(.354)
INTERCEPT	.870*	(.027)	.206	(.130)
R^2	.288		.238	
N	15		10	

* $p < 0.10$, † $p < 0.05$. Standard errors are in parentheses.

sales of US soft drink and detergent products in Arab countries. We find a statistically significant but economically modest and short-lived negative impact of the war on sales of US soft drinks in some countries, and no discernible impact on the sales of detergents in any country. Similarly, variation in aggregate market shares of US products across countries correlates with consumer attitudes toward the US in the soft drink market but not in the detergent market. Overall, our estimates suggest that, at least in the two important consumer goods markets we examine, the element of cost from this source is a small proportion of the total costs of the war.

References

Ashenfelter, O., S. Ciccarella, and H. J. Shatz, 2007, "French Wine and the U.S. Boycott of 2003: Does Politics Really Affect Commerce?," *Journal of Wine Economics*, 2, 55–74.

Baron, D. P., 2001, "Private Politics, Corporate Social Responsibility, and Integrated Strategy," *Journal of Economics and Management Strategy*, 10, 7–45.

Baron, D. P., 2003, "Private Politics," *Journal of Economics and Management Strategy*, 12, 31–66.

Bilmes, L., and J. Stiglitz, 2006, "The Economics Costs of the Iraq War: An Appraisal Three Years After the Beginning of the Conflict," NBER Working Paper 12054.

Chavis, L., and P. Leslie, 2009, "Consumer Boycotts: The Impact of the Iraq War on French Wine Sales in the U.S.," *Quantitative Marketing and Economics*, 7, 37–67.

Fisman, R., and E. Miguel, 2007, "Corruption, Norms, and Legal Enforcement: Evidence from Diplomatic Parking Tickets," *Journal of Political Economy*, 115, 1020–1048.

Friedman, M., 1999, *Consumer Boycotts*, Routledge.

Haass, R. N., 1997, "Sanctioning Madness (Political and Economic Sanctions)," *Foreign Affairs*, 76, 74–86.

Hong, C., W.-M. Hu, J. E. Prieger, and D. Zhu, 2010, "French Automobiles and the Chinese Boycotts of 2008: Politics Really Does Affect Commerce," unpublished manuscript.

Hufbauer, G. C., K. A. Elliott, T. Cyrus, and E. Winston, 1997, "US Economic Sanctions: Their Impact on Trade, Jobs, and Wages," Working Paper Special. Washington: Institute for International Economics.

Innes, R., 2006, "A Theory Of Consumer Boycotts Under Symmetric Information And Imperfect Competition," *Economic Journal*, 116, 355–381.

John, A., and J. Klein, 2003, "The Boycott Puzzle: Consumer Motivations for Purchase Sacrifice," *Management Science*, 49, 1196–1209.

Michaels, G., and X. Zhi, forthcoming, "Freedom Fries," *American Economic Journal: Applied Economics*.

PewResearchCenter, 2005, "U.S. Image Up Slightly, But Still Negative: American Character Gets Mixed Reviews," Pew Global Attitudes Project, `http://pewglobal.org/reports/display.php?ReportID=247`.

Rarick, C. A., 2007, "Economic Sanctions: Failed Foreign Policy Tool and a Cost to American Business," *Economic Affairs*, 23, 65–70.

Zogby International, 2004, "Impressions of America 2004: How Arabs View America, How Arabs Learn About America," `http://aai.3cdn.net/229fc3112466dc002f_wvm6bhed9.pdf`.

Zogby International, 2005, "Attitudes of Arabs 2005: An In-Depth Look at Social and Political Concerns of Arabs," `http://aai.3cdn.net/6e38e45846c8ce7df5_k0m6be9di.pdf`.

APPENDIX

A Data description

The datasets utilized in the analysis were provided by the retail measurement services division for fast moving consumer goods (FMCG) of the Nielsen company. They refer to the carbonated soft drinks and fabric detergents categories in nine Arab countries: Kingdom of Saudi Arabia (KSA), United Arab Emirates (UAE), Egypt, Lebanon, Jordan, Kuwait, Qatar, Oman and Bahrain. Nielsen employs a stratified national sample of stores in each country in order to collect information for a number of FMGC categories with weekly, monthly or bi-monthly frequency depending on the product category. For the carbonated soft drinks product category information is collected with monthly frequency while for the fabric detergents category the frequency is bi-monthly.

The sample size and the statistical precision of estimates in each country are defined based on nationwide retail census information performed by the company and the Nielsen global statistical standards. The sample of stores covers all the channels (store types) through which the product category tracked is moving and stratification takes place at the regional and channel level (double level stratification) splitting the national sample into non-overlapping groups (stratums).

In all countries, for the top end of the trade (Hypermarkets, Supermarkets) as well as for specific channels organized into chains (i.e. Kiosks), the data collection refers to electronic weekly scanning data supplied by the chain stores. In the rest of the channels, data collection is performed through store audits by professional auditors. Primary data collection is performed at the Stock Keeping Unit (SKU) level. Brand level scores and measurements are derived through contemporaneous aggregation of the SKU level data.

The datasets utilized in the analysis include information about all the brands in the market summing up to the total category sales in each case. For each brand considered the available data referred to the variables, sales volume (in 1000s 8oz cases for carbonated soft drinks and kgs for detergents), average weighted price per unit in the local currency of each country, numeric handling distribution and weighted handling distribution. As with the soft drinks data, detergent prices are not comparable across countries because there are denoted in local currencies. The respective brand weighted average prices were derived as a weighted average across all the relevant SKU prices with the sales of each SKU serving as a weight. Numeric handling distribution refers to the percentage number of stores in the country handling any of SKUs belonging

Table 10: Soft drink brands and number of countries where each is sold

Pepsi Cola Intl (USA)		Coca Cola Intl (USA)	
EVERVESS	4	COCA COLA	9
LIPTON ICE TEA	7	CRUSH	5
MIRINDA	9	FANTA	9
MOUNTAIN DEW	9	KREST	1
PEPSI	9	LIMCA	3
SHANI	8	QUWAT JABAL	5
TEEM	3	SPRITE	9
Cadbury-Schweppes (UK)		Al-ahram Beverages (Egypt)	
7-UP	9	BIRELL	1
CANADA DRY	1	CETRINO	1
ROYAL CROWN	2	FAYROUZ	1
SCHWEPPES	8	YOUSFINO	1
SPORT COLA	2		
		Ugarit (Syria)	
Mecca Cola (UAE)		UGARIT	1
MECCA COLA	1		

to the brand while weighted distribution refers to the percentage sales volume of the category moving through the stores handling each brand.

Table 11: Detergent brands and number of countries where each is sold

Unilever (UK)		National Detergents Co. (Oman)	
OMO	9	BAHAR	4
SURF	8	NO1	3
BONA	1	AYAM	1
SURF	1	SUR	1
CORAL LQD	5	PRINO	1
SUNLIGHT	5	SITE	2
LUX	5		
SKIP	1	Reckitt Benckiser (UK)	
SUPER	1	VANISH	1
RIN	1	WOOLITE	3
WISK	1		
ALL	1	Colgate (USA)	
		AXION	1
Henkel (Germany)		GAMA	1
DAC	7		
PERSIL	9	Al Ahilia Detergent Co. (Oman)	
DIXAN	9	IDEAL	1
X-TRA	4	WADI	1
LE CHAT	2	BELLA	1
WIPP	1	SANA	2
PERWOLL	1		
NICE	1	Daaboul (Syria)	
MIR	1	MADAR	1
PAK	1	MOUDHISH	1
ABAYA	1		
CHEK	1	Qatar Detergents Company (Qatar)	
MICOLOR	1	PEARL	1
P&G (USA)		ICA (Jordan)	
TIDE	9	SUPER WHITE	1
ARIEL	9	ORYX	1
DAZ	5	WONDER WHITE	1
CHEER	6	NEON	1
BONUX	7		
LANG	1	Ditra-Sitra (UAE)	
FAIRY	4	TAJ	2
DASH	1	AL NOUJOUOM	1
YES	1	ZAHRA	2
BOLD	3		
FA	1	FAX (Turkey)	
IVORY	1	Evyap	1
MR. CLEAN	1		