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THE PERFORMANCE OF LARGE VERSUS SPECIALIZED FIRMS: A STUDY OF FIRMS IMPORTING APPLES INTO NORWAY

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The performance of large versus specialized firms: A study of firms importing apples into Norway

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Abstract: We use highly disaggregated Norwegian custom data of importing firms to investigate differences in obtained import prices in the period 2003-2009. In addition to the importing firm we are also able to identify the foreign exporter. The obtained import prices are related to firm characteristics as size of the firm, degree of specialization and also the chosen invoicing currency. Our focus is on one single product; fresh apples. We find a surprisingly high variation in import prices. It turns out that the firm specific variables, largeness and specialization, result in significantly lower import prices. In addition, if apples are priced in the currency of the exporter, he must accept a 13-18 per cent drop in the price he obtains. This effect proves to be highly significant.

Key words: import prices, firm specific factors, transaction data, tariff regimes

JEL classification : F15, Q17

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1. Introduction

An essential factor for the performance of importing firms is the price they obtain from their foreign connections. How successful firms are in this respect varies, as one can observe that the purchase price of almost homogenous commodities can differ markedly between firms. Firm-specific factors may be important in explaining this difference. Large firms, for example, can possess resources that make them able to outperform smaller firms in negotiating for a good price. But size is not the only relevant factor. Small, specialized firms can also be observed to do well. Such firms choose a narrow product line, and make a profit by concentrating on what they do well.

In this paper, we analyze if firm-specific factors, such as those mentioned above, matter for the purchase price of importing firms. As to line of business, we shall look at Norwegian firms that trade in fruits and vegetables, and we will study, in detail, firms that import apples to Norway. Next to bananas, apples come in as the largest imported product among fruits and vegetables, both according to volume, and in value. In Norway, the yearly per capita consumption of fresh apples is 12.1 kilos, which is close to the world average of 12.26 kilos (US International Trade Commission, 2010). Consumption of fresh apples from imports was 90%, and in 2009, the value of imported apples to Norway was approximately 60 million dollars.

The last decades have seen an increased attention towards the role of the firm in international trade. Focusing on US firms, Bernard et al. (2009) found that imports into, and exports from, the US are concentrated on a relatively small number of firms, and that the trading firms account for a disproportionate large share of total employment. This focus on the firm has led to an interest into studying the price behavior of firms trading internationally. Based on Hungarian customs data, Halpern and Koren (2007) have presented detailed research on the import price relating it to such characteristics as firm size and market power. This is the thread we will pursue in this paper.

In empirical studies of international trade in agricultural commodities, it is common to control for gravity variables such as distance, GDP and common borders. Atici and Guloglu (2006) found that distance had a strong negative effect on export of fresh fruits and vegetables from Turkey to countries in the EU. In a recent study, Allen (2014) also found this to be the case for trade in agricultural commodities between regions in the Philippines. While those studies

explored bilateral trade values, we focus on prices. Engel and Rogers (1996) are among the first to use the gravity model in price studies. They found that both distance, and crossing borders, matter for differences in consumer prices between US and Canadian cities. More recently, Manova and Zhang (2012) studied Chinese export prices for 6908 different products exported to 231 different destination markets from 96,522 Chinese firms in 2005. They found that distance plays a significant role in explaining price differences between destination markets.

Our research is based on customs data obtained from Statistics Norway. The novelty of our data set is that we are able to identify both the buyer and the seller in each shipment of apples from different countries of origin. In a recent paper, Bernard et al. (2014) also used buyer-seller linked customs data. Their study covers every Norwegian foreign trade, and looked for the importance of the foreign traders' heterogeneity in explaining trade patterns. The aim of our paper is different. Our focus is to study the price behavior of Norwegian importers within a specific industry. We examine how various types of firms fare in the competition to gain advantageous prices on the commodity they buy. Firm types are identified according to size and specialization. Furthermore, we know the invoicing currency, so we can measure the effect of the choice of invoicing currency on the import price. Lastly, we allow standard gravity variables to affect the import price received by the Norwegian importers.

In the season for Norwegian apples, from May through November, the authorities try to stabilize the price of apples. This effort is supported by a season-specific tariff. In Section 2, we describe, in detail, how this regulation of the market is conducted. Since the market functions quite differently during the two periods, we will also investigate the price formation in both periods.

In Sections 3-4, we present descriptive statistics for the main variables, and find some revealing features. First, we find considerable variation in our transaction-based price data. This feature does not conform to findings elsewhere in the literature. Based on survey data, Fabiani et al. (2005), for example, observed stable prices between buyers and sellers in the Euro Area. Second, we present descriptive survival rates that seem to indicate that relationships of importing firms are characterized by instability. The presence of short-lived trade relations on aggregated trade flows are well known in the literature, see for example Besedeš and Prusa (2006a) and Nitsch (2009). In addition, Besedeš and Prusa (2006b) found that trade relations are shorter for trade in homogeneous products than for trade in differentiated products. The

results from the econometric analysis are presented in Section 5. Lastly, in Section 6, we offer concluding remarks.

2. Institutional characteristics

It is well known that international trade in agricultural commodities, including apples, is heavily regulated. In this section we give the details of how this regulation is conducted in Norway. Last we give an overview of the size and pattern of the imports of apples into Norway.

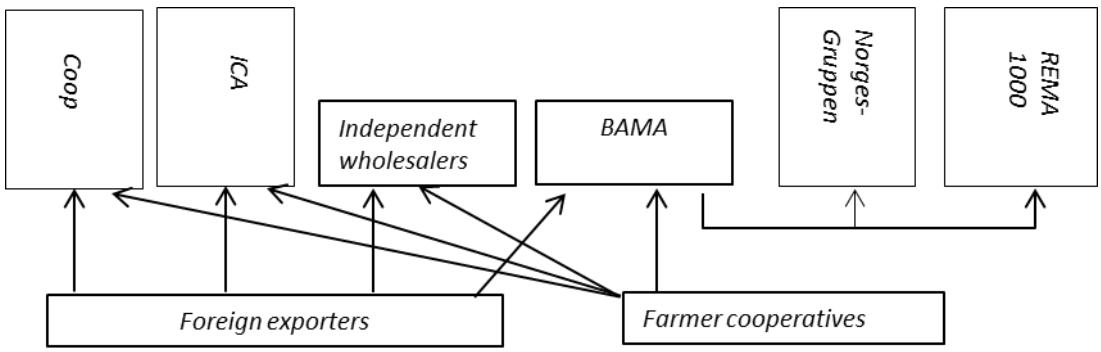
2.1 Market participants (Traders)

In the Norwegian market for fruits and vegetables we find five large wholesalers, as illustrated in Figure 1. BAMA is the largest with a market share of around 60 %. Moreover, we have four large vertically integrated firms; the consumer cooperative, Coop, the two private firms ICA and REMA 1000, and NorgesGruppen.[3] In addition, we have a small group of independent wholesalers. As shown in the figure, the wholesalers are connected to Norwegian farmers through farmer cooperatives.[4]

BAMA has an arrangement to deliver fruit to NorgesGruppen and REMA 1000.[5] Among the independent wholesalers, we have several firms that are specialized into imports of fruits and vegetables.

[3] NorgesGruppen is a cooperation of private shops; Meny/Ultra, Spar/Joker and Kiwi, in addition to other local shops.
[4] There are four farmer cooperatives of which Gartnerhallen SA is largest.
[5] The delivery of apples to REMA 1000 takes place through a separate distribution company.

Figure 1: Traders in the Norwegian market for fruit and vegetables



2.2 Market regulation

The import of apples into Norway is currently protected by a tariff during the period between May 1st and November 30th. With exceptions the tariff is set to NOK 4.83 per kg.[6] There are a small EU quota, and three WTO quotas, that are auctioned away.[7] Traders that participate in these auctions pay no tariff which means that the auction price is always below or equal to the tariff. In the period from December throughout April, the tariff is symbolically set to NOK 0.03 per kg.

The tariff is administered by the Norwegian Agricultural Authority (NAA). NAA also organizes the auctions, and can also reduce the tariff on a temporary basis.[8] Prices of products from Norwegian farmers are stabilized around target prices.[9] The target price for apples is tied to the price farmers receive on their sale to the farmer cooperatives. A stabilized price means that this wholesale price is +/-12 % around the target price. NAA organizes the practical details around stabilization of the wholesale price. If the wholesale price surpasses 12 % for two consecutive weeks, NAA will reduce the tariff on a temporary basis. If the price is below 12 %, the authorities will either finance storing of apples or try to motivate farmers to send apples into

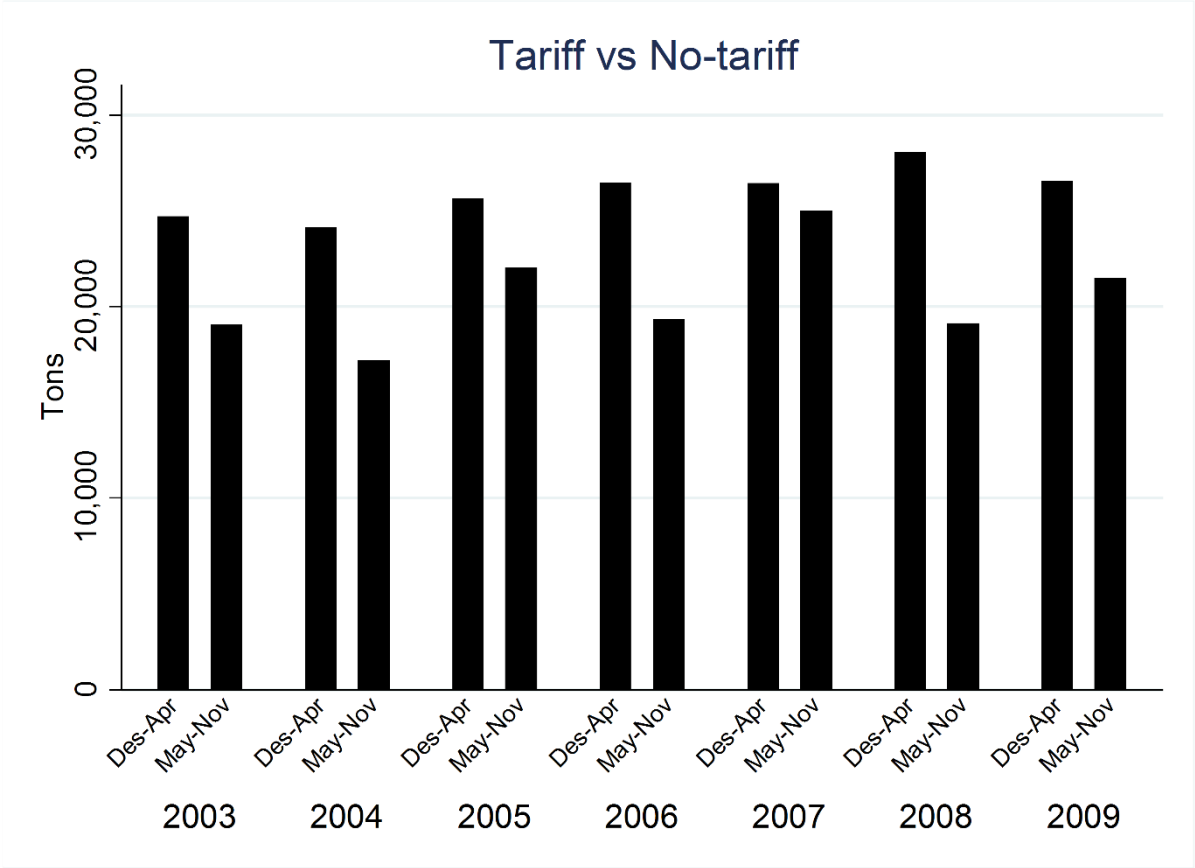
[6]The tariff for imports from Turkey and Tunis is 4.58 NOK/kg, and for imports from GSP and SACU-countries 4.11 NOK/kg.
[7]On a yearly basis, the quotas add up to 10 000 tons. For the sake of comparison, average yearly import (2003-2009) during the "tariff period" is 23 104 tons.
[8]As an example: If the Norwegian production period of apples is assumed to be late one year, NAA can open for tariff-free import of apples in, for example the first two weeks of May. In Table A.1 in the Appendix, we have specified the use of administrative tariff reduction for apples.
[9]The target prices are determined annually in negotiations between the Norwegian government and the two farmers' unions Norges Bondelag (the Norwegian Farmers' Union) and Norsk Bonde- og Småbrukarlag (the Norwegian Farmers' and Smallholders Union).

processing activities, such as juice. Usually, the wholesale price closely follows the target price. In Figure A.1 in the Appendix, we illustrate this for the year 2009.

2.3 The size and pattern of import

Figure 2 gives information on the yearly import of apples. In the figure, each year is divided into the tariff-free (December 1st-April 30th) and the tariff (May 1st-November 30th) period. It is striking that import of apples is not a seasonal phenomenon. It takes place evenly over the entire year with the import in the tariff-free period somewhat above that in the tariff period.[10]

Figure 2: Norwegian import of apples in tons, tariff and no-tariff period 2003-2009



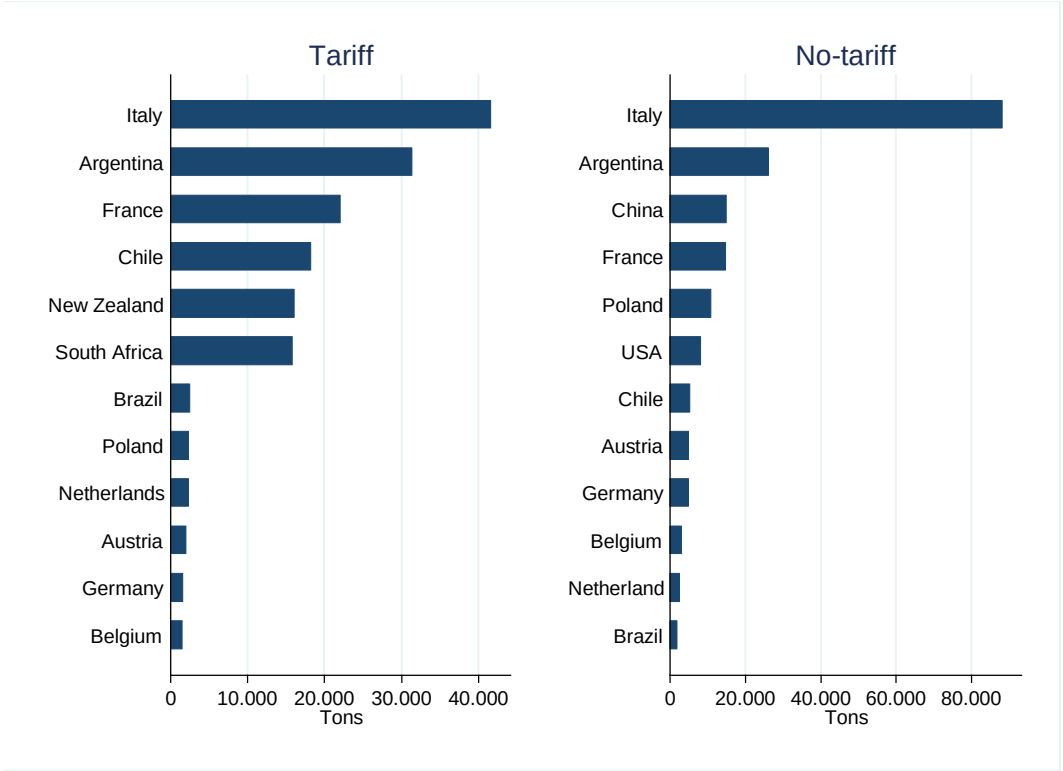
(Source: Statistics Norway)

Figure 3 below, lists the most important countries of origin for Norwegian importers. Most of the imported apples come from Italy, Argentina and France. For some countries, like New

[10]In Figure A.2 in the Appendix, we give further details in the form of domestic production and auction data.

Zealand and South Africa, almost all the import takes place in the tariff period. Naturally, the explanation is seasonal variations in production between countries in the southern- and northern hemispheres. According to the "Apples Industry and Trade Summary" from the US International Trade Commission (2010), the largest global markets for fresh apples are China, the US, and the EU. These are also the world's largest producers of apples.

Figure 3: The largest exporting countries 2003-2009



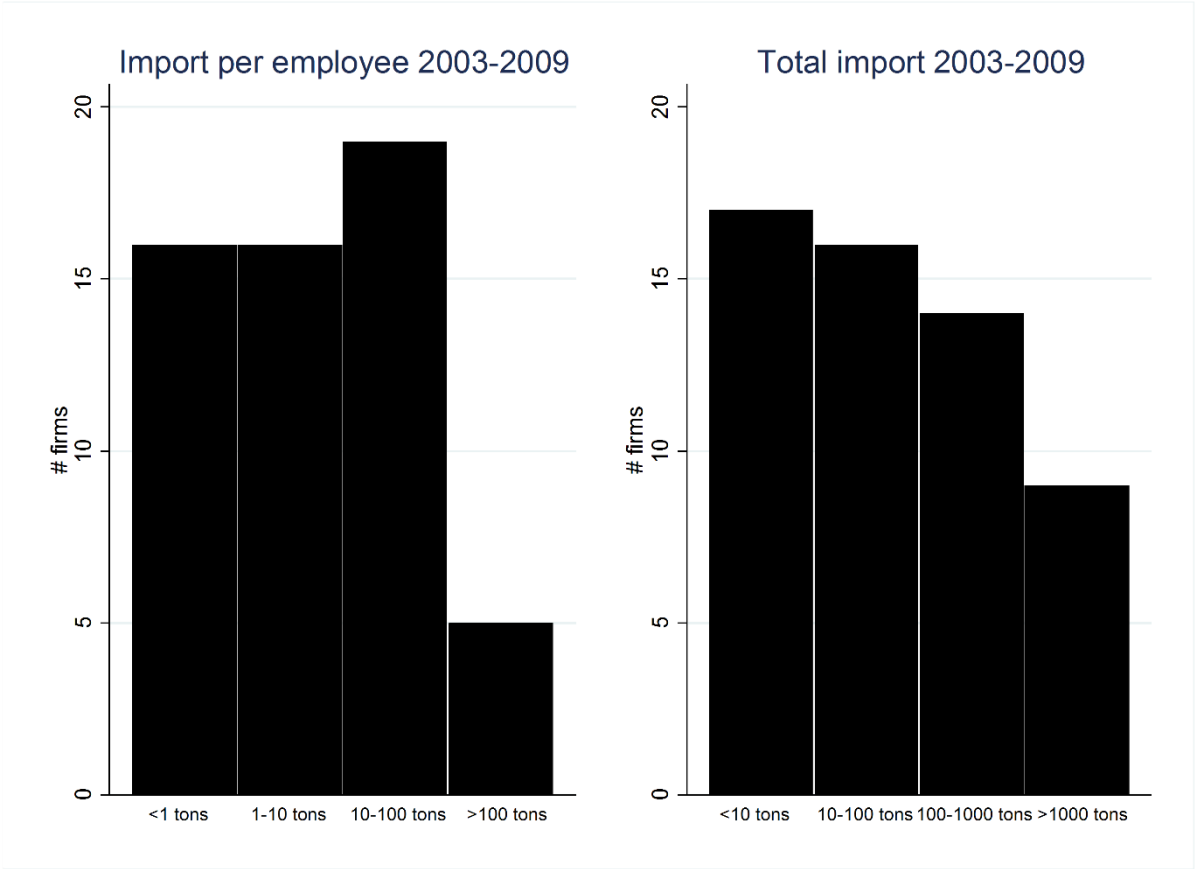
(Source: Statistics Norway)

3. Data and descriptive statistics

Our data set contains all the information we find in the customs declarations for import of fresh apples, collected by Statistics Norway, for the years 2003-2009. Fresh apples are covered by two different HS-codes in the Norwegian customs tariff; one for the tariff-free period, and the other for the tariff period. From the custom declarations, we take out the import date, the importing firm, the exporting firm, the country where the apples are harvested, the volume and value, and the invoice currency. In addition, Statistics Norway has provided us with the number of employees in the importing firms.

The data sample consists of 34,553 transactions, of which 18,516 belong to the tariff-free period.[11] The transactions originate from 36 different countries. A total of 1,533 foreign exporters and 56 different Norwegian firms are involved. The importing firms vary in size, as shown in the right panel in Figure 4, where the firms are grouped according to total import during the period. Most of the firms are in the smallest category. In the left panel, firms are grouped according to how large the import per employee is,[12] and we interpret this as the degree of specialization. Again, most of the firms are placed in the smallest category.

Figure 4: Firms' import per employee 2003-2009, and firms' total import 2003-2009.



In our study, we use the unit value (statistical value divided by volume in kilo) as a measure for the import price. Neither tariffs nor auction price are included in this price. Table 1 shows the distribution of the import price. We see that the variation in the apple price is high. In the tariff period, as much as 4.86 % of the transactions have kilo prices above NOK 20, while 6.42 %

[11] In the original data set we had 35 834 transactions. We had to delete 1281 of the transaction because of lack of GDP data for some of the foreign countries and lack of employment data for some of the importing firms.
[12] We have computed this as the total import during the period divided by the average number of employed persons over the period.

have kilo prices below NOK 5. Naturally, some of the variation is caused by price variation between years (see Figure 5). But even within a given month, in a given year, prices do vary considerably.[13]

In Table A.2 in the Appendix, we have grouped prices after country of origin. The price of apples from some countries is surprisingly high. For example, in the tariff period, the import of apples from Sweden is NOK 54.65, which is more than 5 times higher than the average. The reason for this variation might be preferences for rare types of apples, e.g. preferences for apples grown in a specific way (for example ecological). Naturally, the most expensive apples take a small part of the imported volume.

Table 1: Unit price. Share of transactions (%). 2003-2009

Unit price (NOK/kg)	No-tariff period (%)	Tariff period (%)
> 20	2.40	4.86
15-20	3.00	4.23
10-15	11.53	13.91
5-10	74.48	70.58
< 5	8.59	6.42
Average price	8.76	10.28
Standard deviation	7.91	10.74

The type of currency used in the transaction plays a role in our analysis. From Table 2, we see that the euro is the single most used invoicing currency (56 %), while the Norwegian kroner is the second most important (38 %). 36 % of the trades invoiced in NOK originates from Italy, while 13 % come from France (not reported in the table). The use of American dollars is only observed in 1.8 % of the trades. We also see that vehicle currency pricing is important. An example of a vehicle currency is when euro is used in a trade between Argentina and Norway.

[13] We illustrate this by looking at September 2006. Average price this month is NOK 11.51. Standard deviation is 15.87, which is higher than the standard deviation for the whole sample. 1.19 % of the prices are below NOK 5, while 5.55 % is above NOK 20.

Table 2: Type of currency. Share of transactions (%). 2003-2009

Currency	No-tariff period (%)	Tariff period (%)
Euro	55.30	56.71
Norwegian kroner	39.71	37.12
Other	4.99	6.17
Exporter currency pricing	46.85	37.98
Importer currency pricing	39.71	37.12
Vehicle currency pricing	13.44	24.90

Data for geographical distance is obtained from the CEPII[14] Geodist-database, and GDP data is taken from the World Bank (World Development Indicators (WDI)).

4. Firms' characteristics

The number of importing firms varies from 28 to 36, depending on year, as reported in Table 3. As shown in Figure 4, few of the importers are large. Over the years 2003-2009, we find that 7 firms take 96 % of the imports, of which the three largest take 77 %. In the second column of Table 3, we report the number of foreign firms involved in the apple trade to Norway. We see that the number of exporting firms is much larger than importing firms, meaning that Norwegian firms source from many foreign sellers.

Table 3: Active firms. 2003-2009

Year	Active importers	Active Exporters
2003	32	380
2004	30	397
2005	28	352
2006	36	374
2007	30	369
2008	33	383
2009	30	297

[14] Centre d'Etudes Prospectives et d'Informations Internationales

Table 4, gives firm specific information, first for the three firms with the highest import volume, named as A, B and C. Thereafter, we offer information for the firms that are specialized in international apple trade. Since the product line of these firms is narrow, they will typically be of smaller size. Based on the highest (volume) import of apples per employee, we have in Table 4 labeled the three largest specialized firms as D, E and F.[15]

From the first column in Table 4, we see that for most firms, Italy is the most important source country. Given the information in Figure 3, this is not surprising. The next two columns give information on the firms from which the Norwegian importing firms buy apples. For example, we see that the most important foreign partner for Firm C provides 21 % of its trade, and that 20 of its relationships have a trade share of more than 1 %. Firm C then trades with many firms, none of which is dominating. We see that the same is true for the other Norwegian importing firms. In the fourth column, we have given the average price that the various firms have obtained over the period. We see that there is a tendency for the specialized firms to obtain a lower purchase price (average NOK 7.20) than the high volume firms (average NOK 8.10). From Table 1, we see that the average price for the whole data set is NOK 8.76, and NOK 10.28 for the tariff-free, and tariff period, respectively. Those prices are higher than the import prices the largest firms obtain. So even if specialized firms perform best, the large firms also fare better than the average.

The last column in Table 4 offers information on the invoicing currency. We see that the majority of specialized firms choose the euro, while among the high volume firms there is a mix between Norwegian krone and the euro.

[15] They account for 12 % of the total Norwegian apple import. None of the high volume firms are among the three largest specialized firms.

Table 4: Firm specific features of important Norwegian importers

	Largest market	Largest Foreign trader	# firms > 1 %	Average price (NOK)	Preferred currency
High volume				8.10	
Firm A	Italy	24 %	20	8.26	EUR (95 %)
Firm B	Italy	17 %	17	8.10	NOK (99.8 %)
Firm C	Italy	21 %	20	6.56	EUR (99 %)
Specialized				7.20	
Firm D	France	16 %	14	7.10	EUR (88 %)
Firm E	Italy	23 %	18	7.00	EUR (76 %)
Firm F	France	16 %	26	7.30	EUR (89 %)

Table 5 gives characteristics of the 10 largest foreign firms in the data set. As the first two columns show, most of the exporters trade only with one importer. This is the opposite of what we found was the case for the Norwegian importers. The main reason is presumably that the Norwegian importers buy apples from several countries. But even if we take the export from one particular country, for example Italy, Norwegian importers usually buy from many Italian exporters, while the Italian exporters usually trade with only one Norwegian firm. From the last column in Table 5, we see that for the foreign exporting firms, there is a balance in the choice of invoicing currency between Norwegian krone and the euro.

Our main findings so far, are that the Norwegian importers show a diversified trading pattern. This is the case, even if we narrow our study to a single country. Furthermore, we find no significant difference in this pattern between high volume and specialized firms.

Table 5: Firm specific features of important foreign exporters

	Total # of Norwegian partners	The most important Norwegian partners	Preferred invoicing currency
Firm A	1	100 %	NOK (99.8 %)
Firm B	2	97 %	NOK (98.7 %)
Firm C	5	58.8 %	EUR (99.8 %)
Firm D	1	100 %	EUR (100 %)
Firm E	7	75 %	NOK (75 %)
Firm F	1	100 %	NOK (100 %)
Firm G	3	88 %	NOK (81.5 %)
Firm H	1	100 %	EUR (99.7 %)
Firm I	1	100 %	NOK (100 %)
Firm J	1	100 %	EUR (100 %)

In the following, we look closer into the stability of trading patterns between firms. Besedeš and Prusa (2006a, 2006b) studied the duration of international trade relationships and found that there exists a substantial amount of entries, and exits, in trade relationships, and that the average duration for trade of a given product between two countries is very short-lived. We define duration as the number of consecutive years an importer purchases apples from a given exporter, and estimate different Kaplan-Meier survival rates.[16] The estimates are reported in Table 6.[17]

Table 6: Survival rates

	Mean survival (years)	1 year	3 year	5 years	share of volume in the long-lived relations
1) All firms	3.0	68 %	20 %	8 %	63 %
2) Firms with high import volume (Firm A,B,C)	4	74 %	30 %	13 %	77 %
3) Firms with high import per employee (Firm D,E,F)	3.7	68 %	20 %	5 %	22 %

[16] The Kaplan-Meier estimator is a non-parametric estimate of the survival function. To investigate the survival rates we could have estimated the hazard rates using a Cox-model. Such an exercise lies outside of the scope of this paper.

[17] For this basic descriptive exercise, we choose not to problematize issues regarding left-censoring and the existence of multiple spells.

The Kaplan-Meier survival estimates give us important information on how the duration of trade differs between different importer-exporter pairs in our data set. We find that the firms with high import volume have a higher mean survival rate with its trading partners than the overall survival rate in the data set, and for firms with high import per employee. After the first year, more relations are active for the high-volume firms than the overall number for the data set. The same is the case after three years. In the long run (5 years), 13 % of the trade relations for the high import volume firms have survived.[18] Even if this survival rate is substantial higher than in the overall sample, it seems to be rather low. But even if 87 % of the relations have ended after five years, the surviving 13 % accounts for 77 % of the traded volume during the entire period. Observe that for the specialized firms, the opposite is the case. The remaining 5 % of the relationships after 5 years take only 22 % of the volume traded during the 2003-2009 period. So the relationships of the specialized firms have more of a hit-and-run nature than for the high-import volume firms. This might be one of the explanations for why the specialized firms trade at lower prices than the high volume firms.

Our finding that the lowest prices are observed for the group of firms that are least likely to change their trading partner is not in line with the findings in the literature. Monarch (2014) found that reduced buyer-supplier friction resulted in lower prices.

5. Econometric analysis

Firms can affect the outcome of their business in various ways. Besides efforts to reduce operating costs, decisions tied to purchase and sales are important. We have no firm-specific information available on the selling price, or operating costs. But from our dataset, we are able to identify the purchase price of the importing firms. So when we try to explain the economic success of importing firms, we relate that to the purchase price they have been able to obtain.

In Section 2.2, we noted that the competition in the apple market differs between trade regimes, i.e. the tariff-free (December 1.–April 30.) versus the tariff period (May 1.–November 30.). Figure 5, gives the development of the import price for the two trade regimes computed as yearly averages. Except for 2004 and 2005, we see that the average import price for the two trade regimes follows a similar pattern. However, there is a tendency for the import price in the

[18] Rudi et al. (2012) investigate different factors that impacts the duration of trade relationships in US. fresh fruits and vegetables import. Their sample period is 1996-2008, and their data is at the country level. For apples, they report an average duration of 5.1 years, which is in line with our findings. Their study is not directly comparable to ours since it is based on country-level data.

tariff period to be substantially higher than in the non-tariff period. Since import prices are exclusive of tariffs, tariffs are not the direct explanation for this difference.

Figure 5: Mean prices by period and year

Our observations consist of all transactions between importers and exporters during the 2003-2009 period. We use the index pair (*i*,*j*) for an importer *i*-exporter *j* relationship. For the transactions performed in each relationship, we identify the year, *t*, and tariff regime, *N* (non-tariff) or *T* (tariff). In some of the relationships, several transactions take place within the same time period ((*t*,*N*) or (*t*,*T*)). We use *k* as a count-index for these transactions. $P_{i,j}^{N}(k,t)$ is then the price a Norwegian importer *i* obtains from a foreign exporter *j* in his *k*'th transaction in the non-tariff period of year *t*. In (1), we have specified the variables that are used to explain the import price of apples in the non-tariff period.

$$(1)\qquad \ln P_{i,j}^{N}(k,t) = \beta_0 + \beta_1 \ln\left(Dist_j\right) + \beta_2 \ln\left(GDP_j(t)\right) + \beta_3 Border_j + \beta_4 ln(Imp\ share_i(t)) + \beta_5 \ln(Imp\ per\ employee_i(t)) + \beta_6 ECP_{i,j}(k,t) + \beta_7 VCP_{i,j}(k,t) + \beta_8 EU_j + \varepsilon_{i,j}(k,t).$$

The three first variables are in line with a standard gravity approach.

(i) We include the geographical distance between the capital of Norway (Oslo) and the capital of the country (*j*) where the apples are grown, $Dist_j$. This variable reflects transportation cost, but also familiarity with the trading country.

(ii) In addition, we include GDP-per capita for country *j*, GDP_j, for the following reason: An increase in the national income in the country of origin (country *j*) means an increase in demand for fruit in that country, and thus, an increase in the domestic price, and therefore the price they sell apples for to firms in other countries (Atici and Guloglu, 2006).

(iii) We include a common border dummy in our model, $Border_j$, to control for a possible "neighbor effect." This variable takes the value 1 if country *j* borders Norway and 0 otherwise.

Next we include two firm-specific variables.

(i) We expect that firm size matters. We use a firm's share of total import as a measure of its size ($Imp\ share_i$).

(ii) As we argued in the introduction, we also expect the firm's degree of specialization to matter. We measure the degree of specialization as the volume of apples imported per employed in firm *i* ($Imp\ per\ employee_i$).

We also take into consideration the currency that has been used in the transaction. There are three alternatives for currency choice: The currency of the importer (Norwegian krone), the currency of the exporter or a currency from a third country (vehicle currency). This choice is modelled by two dummy variables, *ECP* and *VCP*.

(i) *ECP* (Exporter Currency Pricing) takes on the value 1 if the trade is invoiced in the exporter's home currency, and 0 otherwise. As long as firms are risk-averse, it is in their interest that the transaction is settled in their national currency. Therefore, foreign exporters that are able to obtain a trade invoiced in their own currency are expected to pay a premium in the form of a lower price.

(ii) *VCP* (Vehicle Currency Pricing) takes on the value 1 if the trading partners choose to make use of a vehicle currency in the transaction, and 0 otherwise. In this case, both trading partners are exposed to exchange rate risk.

Lastly, the EU-dummy, EU_j, takes on the value of one if the imported apples having been harvested in an EU-country, and zero otherwise.

As we emphasized in Section 2.2, the price formation of apples differs between the trade regimes. In the tariff period, the price of the apples is stabilized by the Norwegian authorities. That means that exporters of apples into Norway not only face competition from the Norwegian producers, but they also see a regulated price. When we explain the import prices in the tariff period, $P_{i,j}^T$, we, therefore, include the Norwegian target price of apples, *Target*, as an explanatory variable. Furthermore, the GDP from the various countries, which we took as a proxy for the apple price of the exporting countries in the tariff-free case, are taken away, i.e. we assume that the exporting firms do pricing to the market in the tariff period.[19] We then expect β_2 to be positive. However, the interesting question is how close this coefficient is to 1. A β_2 equal to 1, means that a one percent increase in the target price is completely copied into the import price. Besides the target price, we expect the import prices in the tariff period to be affected by the same set of variables as in (1).

$$(2) \quad \ln P_{i,j}^T(k,t) = \beta_0 + \beta_1 \ln(Dist_j) + \beta_2 \ln(Target(t)) + \beta_3 Border_j + \beta_4 \ln(Imp\ share_i(t)) + \beta_5 \ln(Imp\ per\ employee_i(t)) + \beta_6 ECP_{i,j}(k,t) + \beta_7 VCP_{i,j}(k,t) + \beta_8 EU_j + \varepsilon_{i,j}(k,t).$$

Table 7 reports summary statistics for the variables of interest.[20]

Table 7: Summary statistics, overall

Variable	Mean	SD	Min	Max
Import price ($P_{i,j}$)	9.46	9.36	1.18	272,7
- No tariff ($P_{i,j}^N$)	8.76	7.91	1.18	272,7
- Tariff ($P_{i,j}^T$)	10.28	10.74	2.06	199,7
Distance (km)	4832	5228	417	17991
GDP (billions)	1419	1565	5	13144
Import share	0.3	0.26	0.000007	1
Import share per employee (tons)	6.67	12.7	0.000	135
Target price	10.40	1.14	9	12.5

[19] Results when we include GDP from the various countries are offered in Appendix A.5

[20] For statistics on firm information see Tables 3-5, choice of currency see Table 2 and share of trade to the EU Figure 3.

For statistics on the currency used in the transactions (*ECP* and *VCP*), we refer to Table 2. Furthermore, the share of trade to the EU is indicated in Figure 3.

In Table 8, we report the results. For both periods, we first report the results for the full sample.[21] Then we show results in a sample where only import prices below 20 NOK/kg are included. The estimation in the non-tariff period is done by including year dummies. Since the target price varies between, but is fixed within, years, this variable serves as a year dummy variable in the tariff period estimation.

In Table 8 we have grouped the various variables in three sections: Firms specific, market specific and gravity related variables.

[21] To divide the sample into a tariff and non-tariff period can be problematic, because the firms may act strategically between the periods. For example, in order to avoid tariffs firms may increase their import of apples in the end of April just before the tariff period starts. In Section 6 of the Appendix we show a graph picturing the imports two weeks before and two weeks after the tariff period. We see that the sales are about the same in the weeks we look at. Our conclusion is then that there is absence of this kind of strategic behavior in our data set.

Table 8: Main results

ln Unit value	***No-tariff period***		***Tariff period***	
	OLS,all values	*OLS, values < 20 NOK/kg*	*OLS, all values*	*OLS,values<20 NOK/kg*
Firm specific variables:				
ln Imp share	*-0.013***	*-0.013***	*-0.036**	*-0.015***
	(0.006)	*(0.006)*	*(0.019)*	*(0.006)*
ln Imp per employee	*-0.043****	*-0.038****	*-0.055***	*-0.037****
	(0.011)	*(0.010)*	*(0.022)*	*(0.013)*
ECP	*-0.137****	*-0.136****	*-0.187****	*-0.129****
	(0.041)	*(0.041)*	*(0.069)*	*(0.040)*
VCP	*0.091**	*0.079*	*-0.028*	*0.033*
	(0.050)	*(0.050)*	*(0.120)*	*(0.095)*
Market specific variables:				
ln GDP	*0.043****	*0.046****	-	-
	(0.015)	*(0.015)*	-	-
ln Target price	-	-	*0.714****	*0.729****
	-	-	*(0.168)*	*(0.122)*
Gravity related variables:				
ln *Dist*	*0.178****	*0.184****	*0.197****	*0.223****
	(0.032)	*(0.032)*	*(0.051)*	*(0.041)*
Border	*1.938****	*0.228*	*1.813****	*0.077*
	(0.074)	*(0.184)*	*(0.178)*	*(0.111)*
EU	*0.473****	*0.477****	*0.416****	*0.456****
	(0.043)	*(0.043)*	*(0.103)*	*(0.090)*
Constant	*-0.878***	*-1.030****	*-1.308**	*-1.639****
	(0.381)	*(0.350)*	*(0.709)*	*(0.513)*
Observations	*18,516*	*18,057*	*16,037*	*15,238*
R-squared	*0.575*	*0.345*	*0.582*	*0.220*
Year dummies	*Yes*	*Yes*	*No*	*No*

Robust standard errors in parentheses clustered on (firm, origin)
*** p<0.01, ** p<0.05, * p<0.1*

We see that increased import shares result in significantly lower import prices. We find this to be the case, both for the complete, as well as the restricted sample set in both regimes. So there seems to be an economy of scale effect in our data set. But we also find a specialization effect; i.e. increased import per employee leads to a decrease in the import price. This effect is more pronounced than the economy of scale effect, in the sense that it is more significant. We see that the specialization effect is independent of the trade regime, and also the size of the sample.

As for the currency effects, we see a clear risk premium. If exporters are allowed to have the sale contracts settled in their home currency, they have to pay a discount in the form of a lower price. We see that this effect is highly significant: 13.7 % lower import price in the tariff free period, while the import price is lowered by 18.3 % in the tariff period. Lastly, the effect of using a vehicle currency is insignificant, as expected.

The next two variables, *GDP* and *Target*, reflect market structure. The *GDP* variable is included in the non-tariff period. This variable function as a measure of the price of apples in the exporting country, and we see that this variable is highly significant. The interpretation is then that in the non-tariff period, the pricing of imported apples is cost based.[22] Interestingly, in the tariff period, the Norwegian target price is also highly significant. The coefficient attached to this variable is 0.714. That means that we have close to a complete copying of the Norwegian price. So, it seems that the pricing policy of exporters of apples into Norway in the tariff period is characterized by pricing to the market.

We have also included three control variables. The first of these is distance to the country of origin. This is highly significant in both periods, a result that is in accordance with what is found in the referred literature. The border effect needs a comment. In both periods, the border effect is highly significant. However, when prices above NOK 20 are excluded, the border effect disappears. The explanation for this is that the largest import prices originate from Sweden, as we have shown in Table A.3 in the Appendix. Observe also that the EU dummy is positive and highly significant. This is particularly true in the tariff-free period. This can be caused by many factors. It may reflect quality. Some of the EU-countries are known to have high quality apple producers. As a last point let us mention that we also have controlled for possible effects from direct trade from the country of origin vs. the shipment going by a second country before reaching Norway. But taking this into account had no significant impact on the results.

[22] In Section 5 of the Appendix we report the results when GDP for the various foreign countries is included. We see that GDP in this case is insignificant, as it should be.

6. Conclusion

As reviewed by Bernard et al. (2007), in the last decades we have seen an increasing interest in firms engaged in international trade. This paper focus on trading firms engaged in imports, in particular the price they are able to obtain on the goods they import. We have used highly disaggregated Norwegian customs data to investigate if firm specific factors explain differences in import prices between firms, and we find this to be the case. First, the nature of the firm matters. The larger and the more specialized a firm is, the lower is the firm's import price. Second, the way a firm operates matter. In this respect we have examined the firm's decision as to which currency to use. And here we find a clear and significant currency effect. If an importing firm manages to trade in Norwegian kroner, that comes with a cost in the form of a higher import price.

From the descriptive statistics, we find it striking that the import price varies markedly between firms. This gives profit possibilities for firms. As pointed out above, one of our findings is that the specialized firms are able to obtain lower import prices than other firms. These firms also have more unstable trading relationships than is the case for other firms. Their trade behaviors then conform to profit seeking firms using a hit-and-run strategy.

We have stressed that the Norwegian market is regulated half of the year. During the Norwegian harvesting season there is a (high) tariff on apples. In addition, the authorities operate with a target price. It seems that the competition in the market differs between the tariff and non-tariff period. In the non-tariff period it seems as if exporters set prices based on costs. However, in the tariff period it seems that the exporters choose to price to the market. But even if the pricing strategy changes, our econometric results tell us that the firm specific effects seem to be unaffected. They seem to be almost identical in the two pricing strategy cases.

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Appendix

1. Administrative tariff reductions

Table A.1: Administrative tariff reductions for apples. 2003-2009

Start	End	Tariff
01.05.2003	18.05.2003	0.00
01.05.2004	10.05.2004	0.00
01.05.2005	14.05.2005	0.00
20.11.2005	30.11.2005	2.95
01.05.2006	14.05.2006	0.00
01.05.2007	16.05.2007	0.00
11.11.2007	30.11.2007	0.25
01.05.2008	12.05.2008	0.00
01.05.2009	16.05.2009	0.00
29.11.2009	30.11.2009	0.25

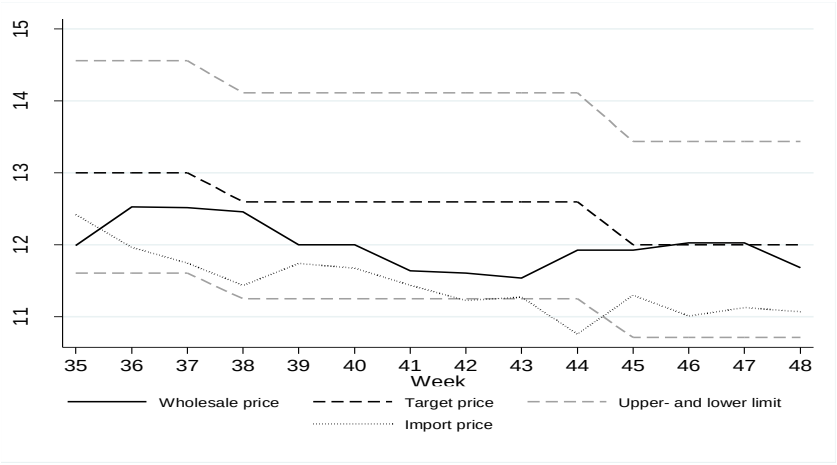
(Source: NAA)

2. Price regulation in the tariff period

In Figure A.1, we illustrate the various apple prices for the Norwegian 2009 season. The prices are given on a weekly basis, where week numbers are posted along the horizontal axis. The three dotted lines give the target price, including the +/- 12 % band width. The dark solid line gives the wholesale price, and we see that this price lies inside the band and fairly close to the target price for the whole period. We have also computed the average import price from the information in our data set. To this computed price we have added the tariff, drawn into the figure as the light marked solid line. With one exception (week 35), we see that the wholesale price for Norwegian apples lies above the import price.[23]

[23] In order to make a just comparison between the import price (including tariff) and the wholesale price, a transportation cost from the harbor to the wholesaler should be added, which we have not.

Figure A.1: Target price, wholesale price and import price inclusive of tariff. 2009

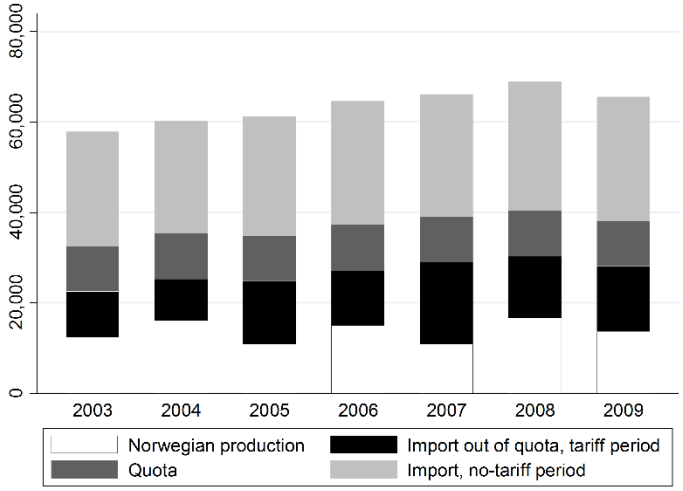


(Source: Statistics Norway and authors own calculations)

3. Norwegian production and import of apples

Figure A.2 illustrates the size of the Norwegian production compared to the import of apples. The Norwegian production is marked as the white part of the columns. It accounts for 21 % of the supply of apples.[24] Observe that the import of apples in the tariff period (May 1st-November 30th) is larger than the Norwegian production. In the figure, we have also marked the size of the auctions, which takes 43 % of the imports.

Figure A.2: Norwegian production and total import in tons. Tariff and tariff-free period. 2003-2009



(Source: Statistics Norway and NAA)

[24] The supply of apples is defined as Norwegian production plus imports. According to Norges Frukt- og Grønnsaksgrossisters Forbund, in 2011 Norwegian apples took 10 % of the apple consumption. That means that a substantial share of the Norwegian apple production goes to processing.

4. The import price of apples in the data set

Table A.2: Unit value by country of origin. 2003-2009

No-tariff period				Tariff period			
Country of origin	**Mean unit value**	**St.dev, unit value**	**Share of total volume (%)**	**Country of origin**	**Mean unit value**	**Std.dev, unit value**	**Share of total volume (%)**
Sweden	51.8	29.24	0.1	Sweden	54.65	25.72	0.1
UK	33.71	12.79	0.02	Finland	53.43	18.2	0.0002
Egypt	25.82	5.79	0.0003	UK	40.73	9.96	0.005
Iran	16.97	2.8	0.0002	India	21.13	6.65	0.002
Israel	15.92	.	0.0003	Denmark	15.83	4.21	0.02
Denmark	11.79	4.02	0.004	Egypt	15.61	3.81	0.005
Turkey	10.99	1.42	0.01	New Zealand	10.84	3.4	10.1
New Zealand	10.05	2.66	0.4	Peru	10.75	.	0.004
South Africa	8.9	2.97	0.3	Morocco	9.35	4.93	0.02
Thailand	8.64	.	0.0005	Chile	9.18	3.38	11.4
France	8.62	3.47	7.9	Netherlands	8.52	3.78	1.5
Italy	8.61	2.66	46.6	China	8.46	2.46	0.5
Netherlands	8.22	4.73	1.3	Italy	8.41	2.88	26
Chile	8.03	2.8	2.9	Switzerland	8.24	2.56	0.1
Brazil	7.92	1.69	0.9	Spain	8.22	3.06	0.3
Spain	7.69	2.47	0.3	South Africa	8.18	1.81	10.0
Argentina	7.49	3.52	13.8	Brazil	7.9	2.88	1.6
USA	7.48	1.48	4.3	Turkey	7.87	3.46	0.01
Uruguay	7.24	1.34	0.1	France	7.66	3.08	13.8
China	7.23	1.82	7.9	Argentina	7.48	3.67	19.6
Austria	7.16	1.12	2.7	USA	7.29	0.77	0.1
Bosnia	6.83	3.09	0.01	Saudi-Arabia	7.26	0.37	0.05
Switzerland	6.69	0.92	0.1	Austria	7.2	1.49	1.3
Belgium	6.64	2.89	1.7	Iran	7.18	.	0.006
Germany	6.36	2.81	2.6	Belgium	6.97	4.21	0.9
Portugal	6.06	0.98	0.01	Portugal	6.91	0.33	0.002
Hungary	5.64	1.13	0.1	Germany	6.78	2.65	1.0
Morocco	5.07	.	0.001	Uruguay	6.4	1.82	0.1
Poland	4.72	2.12	5.7	Hungary	6.21	1.41	0.2
Greece	4.58	1.68	0.01	Chezch Rep.	5.08	.	0.0004
				Poland	4.97	2.44	1.5
				Macedonia	3.86	2.25	0.01

(Source: Statistics Norway and authors own calculations)

5. Results when GDP are included in the regression for the tariff period

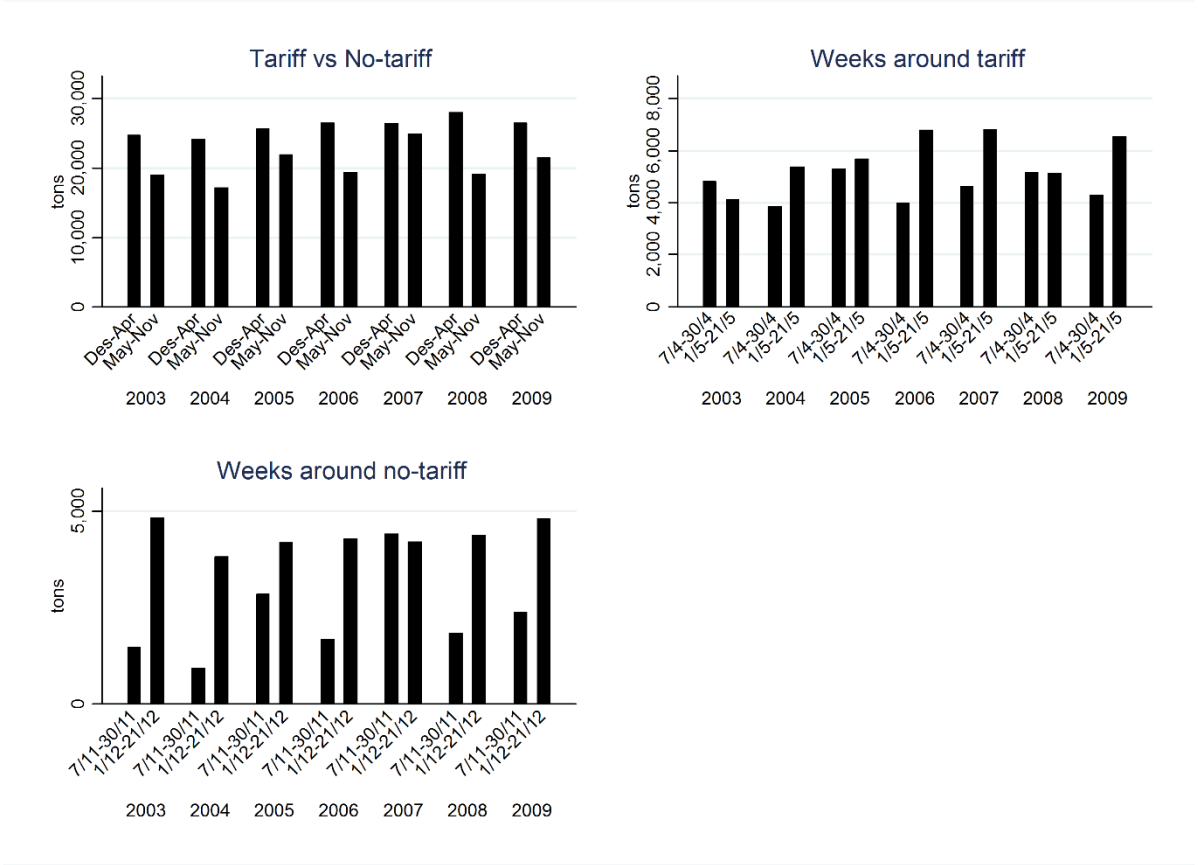
Table A.3: Main results. GDP included in both periods

ln Unit value	***No-tariff period*** *OLS,all values*	*OLS, values < 20 NOK/kg*	***Tariff period*** *OLS, all values*	*OLS,values<20 NOK/kg*
Firm specific variables:				
ln Imp share	*-0.013***	*-0.013***	*-0.038***	*-0.017***
	(0.006)	*(0.006)*	*(0.019)*	*(0.007)*
ln Imp per employee	*-0.043****	*-0.038****	*-0.054***	*-0.036****
	(0.011)	*(0.010)*	*(0.022)*	*(0.012)*
ECP	*-0.137****	*-0.136****	*-0.203****	*-0.145****
	(0.041)	*(0.041)*	*(0.070)*	*(0.041)*
VCP	*0.091**	*0.079*	*-0.030*	*0.031*
	(0.050)	*(0.050)*	*(0.117)*	*(0.091)*
Market specific variables:				
ln GDP	*0.043****	*0.046****	*-0.036*	*-0.037*
	(0.015)	*(0.015)*	*(0.027)*	*(0.025)*
ln Target price	-	-	*0.721****	*0.737****
	-	-	*(0.170)*	*(0.122)*
Gravity related variables:				
ln *Dist*	*0.178****	*0.184****	*0.189****	*0.215****
	(0.032)	*(0.032)*	*(0.048)*	*(0.038)*
Border	*1.938****	*0.228*	*1.749****	*0.010*
	(0.074)	*(0.184)*	*(0.167)*	*(0.109)*
EU	*0.473****	*0.477****	*0.480****	*0.522****
	(0.043)	*(0.043)*	*(0.114)*	*(0.105)*
Constant	*-0.878***	*-1.030****	*-0.323*	*-0.614*
	(0.381)	*(0.350)*	*(0.780)*	*(0.630)*
Observations	*18,516*	*18,057*	*16,037*	*15,238*
R-squared	*0.575*	*0.345*	*0.583*	*0.226*
Year dummies	*Yes*	*Yes*	*No*	*No*

Robust standard errors in parentheses clustered on (firm, origin)
*** p<0.01, ** p<0.05, * p<0.1*

6. Buying decisions in connection with going from one tariff regime to another?

Figure A.3: Imports of apples in the weeks before, and after, a change in tariff regime



(Source: Statistic Norway)

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