

# Data and Programs for “How Exporters Grow”

Fitzgerald, Haller and Yedid-Levi

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## 1. Confidential data access

This work makes use of confidential data from the Central Statistics Office, Ireland (CSO). Under the provisions of the Statistics Act, 1993, the CSO may provide access to microdata files under strict conditions to ensure that the integrity and confidentiality of the data collected under the Act is maintained. The rules, procedures and application forms for access to microdata at the CSO are spelled out on their webpage: search for “data for researchers.” Survey forms and methodology documents for the CSO’s surveys are also available on the web at <https://www.cso.ie/en/aboutus/lgdp/csodatapolicies/dataforresearchers/rmfregister/>.

## 2. Confidential data and cleaning programs

The confidential data sets used in our baseline analysis are called `cip_ex_prodcom.dta` and `exports_newcn.dta`. In one robustness check we make use of an additional data set called `prep_prodcom_data.dta`. In another robustness check we make use of an additional data set called `exports_newcn14.dta`.

The first data set (`cip_ex_prodcom.dta`) is based on the research microdata files of the enterprise data from the Census of Industrial Production (CIP) which is collected by the Central Statistics Office (CSO) in Ireland (Central Statistics Office, Ireland (CSO) (2005), (2006), (2012a), (2012b)). It is obtained after combining, checking and cleaning the original annual files provided by the CSO. To obtain a measure of firm age we complement the CIP data with information on firm’s birth year from the CSO’s Business Register (Central Statistics Office, Ireland (CSO) (2016)). The cleaning files make use of confidential information and can only be made available in the controlled environment of the CSO once we have confirmation from the CSO that the researcher has been granted access to the relevant research micro data files for the purpose of replicating the work in the present paper. A detailed description of how the data is cleaned is included in Section 3.1 of the paper and Section E.1 of the Appendix. We merge the enterprise-level data with data on exports at the enterprise level obtained from customs records (Central Statistics Office, Ireland (CSO)

(2013)) and data on products at the enterprise level obtained from the Prodcom survey (Central Statistics Office, Ireland (CSO) (2012c)).

The second data set (`exports_newcn.dta`) is based on the research microdata files of Intrastat and Extrastat customs records which were matched to firms (enterprises) via the Business Register by the CSO (Central Statistics Office, Ireland (CSO) (2013)). A detailed description of how the data is cleaned is included in Section 3.2 of the paper and Section E.2 of the Appendix. The file to do this makes use of confidential information and can only be made available in the controlled environment of the CSO once we have confirmation from the CSO that the researcher has been granted access to the relevant research micro data files for the purpose of replicating the work in the present paper. We then perform the product concordance over time using the Pierce and Schott (2012) approach. We adapt the code developed by Ilke Van Beveren for concordancing the CN8 classification over time to do this (see Van Beveren et al (2012)), and make use of concordance files provided by Eurostat (n.d.).

The third data set (`prep_prodcom_data.dta`), used for a single robustness check, is based on data from the Prodcom survey which is performed by the Central Statistics Office (CSO) in Ireland (Central Statistics Office, Ireland (CSO) (2012c)). It is obtained after checking and cleaning the original files provided by the CSO. The cleaning file makes use of confidential information and can only be made available in the controlled environment of the CSO once we have confirmation from the CSO that the researcher has been granted access to the relevant research micro data files for the purpose of replicating the work in the present paper. A detailed description of how the data is cleaned is included in Section E.3 of the Appendix. We then perform the product concordance over time using the Pierce and Schott (2012) approach and make use of concordance files provided by Eurostat (n.d.).

The fourth data set (`exports_newcn14.dta`) is used for a single robustness check. It is similar to the second data set (`exports_newcn.dta`) in that it is based on the research microdata files of Intrastat and Extrastat customs records matched to the Business Register by the CSO (Central Statistics Office, Ireland (CSO) (2013) and (2015)). This file is generated by merging the customs records for the period 1996-2014. A detailed description of how the data is cleaned is included in Section 3.2 of the paper and Section E.2 of the Appendix. The cleaning file makes use of confidential information and can only be made available in the controlled environment of the CSO once we have confirmation from the CSO that the researcher has been granted access to the relevant research micro data files for the purpose of replicating the work in the present paper. We then perform the product concordance using the Pierce and Schott approach. We adapt the code developed by Ilke Van Beveren for concordancing the CN8 classification over time to do this (see Van Beveren et al (2012)) and make use of concordance files provided by Eurostat (n.d.).

## 2.1 Cleaning programs

This lists the cleaning programs used in creating the data. This information is also contained in master\_pq.do. Files marked CONFIDENTIAL make use of confidential information and can only be made available in the controlled environment of the CSO once we have confirmation from the CSO that the researcher has been granted access to the relevant research micro data files for the purpose of replicating the work in the present paper. All other files are made available in the attached packet.<sup>3</sup>

1. master\_pq.do
  - Collects all do files and runs them (brief descriptions of what is in each file provided)
2. trademicrosum\_1506.do [CONFIDENTIAL]
  - Reads in the trade data for 1996-2014 (Central Statistics Office, Ireland (CSO) (2013) and (2015)), cleans the data, puts them in panel format [CONFIDENTIAL]
  - generates trademicro14.dta [CONFIDENTIAL]
3. Ilke\_CN\_edited\_1506.do
  - Uses trademicro14.dta [CONFIDENTIAL]
  - Uses concordances CN\_1997.csv through CN\_2014.csv (Eurostat (n.d.))
  - Concords the 8-digit CN codes over time for the 1996-2014 data
  - Generates exports\_newcn14.dta [CONFIDENTIAL]
4. trademicrosum\_1607.do [CONFIDENTIAL]
  - Reads in the trade data for 1996-2009 (Central Statistics Office, Ireland (CSO) (2013)), cleans the data, puts them in panel format [CONFIDENTIAL]
  - generates trademicro.dta [CONFIDENTIAL]
5. Ilke\_CN\_edited\_1412.do
  - Uses trademicro.dta [CONFIDENTIAL]
  - Uses concordances CN\_1997.csv through CN\_2009.csv (Eurostat (n.d.))
  - Concords the 8-digit CN codes over time for the 1996-2009 data
  - Generates exports\_newcn.dta [CONFIDENTIAL]
6. prep\_customs\_180213.do
  - Uses exports\_newcn.dta [CONFIDENTIAL]

- Performs some cleaning
  - Calculates number of markets, products, export revenue, intrastat and extrastat indicators, export entry and exit
  - Generates export\_summary.dta [CONFIDENTIAL]
7. prodcom\_1412.do [CONFIDENTIAL]
- Reads in the 1996-2009 Prodcom data (Central Statistics Office, Ireland (CSO) (2012c)) [CONFIDENTIAL]
  - Performs cleaning
  - Generates pc\_9609.dta [CONFIDENTIAL]
8. prep\_prodcom\_171117.do
- Uses pc\_9609.dta [CONFIDENTIAL]
  - Uses concordance file pc8\_pc8plus\_1996\_2009.dta (Eurostat (n.d.))
  - Generates prep\_prodcom\_data\_150430.dta [CONFIDENTIAL]
  - Generates prodcom\_summary\_171117.dta [CONFIDENTIAL]
9. prep\_cip\_171115.do
- Uses \${data04}pre91.dta, the combined 1979-1990 Census of Industrial Production data (Central Statistics Office, Ireland (CSO) (2006)), extracts the information on start-up dates. [CONFIDENTIAL]
  - Uses \${data09}enter\_clean\_enrmerge.dta, the output of cleaning the 1991-2009 CIP enterprise data (Central Statistics Office, Ireland (CSO) (2005), (2012a), (2012b)) [CONFIDENTIAL]
  - Merges in {data12}birthcease.dta, Business Register birth and cease dates (Central Statistics Office, Ireland (CSO) (2016)) [CONFIDENTIAL]
  - Combines the information from the start-up dates in \${data04}pre91.dta and {data12}birthcease.dta to calculate a birth year variable which is later used to obtain firm age
  - Merges in \${data09}capstock\_fuelsh.dta, capital stocks for the 1991-2009 CIP data, calculated as described in Haller (2012) and Haller and Hyland (2014) using the Census of Industrial Production data (Central Statistics Office, Ireland (CSO) (2005), (2012a), (2012b)). These capital stocks are used in the calculation of TFP [CONFIDENTIAL]
  - Uses export\_summary.dta [CONFIDENTIAL]
  - Uses prodcom\_summary\_171117.dta [CONFIDENTIAL]
  - Generates cip\_ex\_prodcom.dta [CONFIDENTIAL]

## 2.2 Concordance files

1. CN\_1997.csv through CN\_2014.csv: concordances for customs data, obtained from Eurostat (Eurostat (n.d.))
2. pc8\_pc8plus\_1996\_2009.dta: concordances for Prodcom data, created using concordances from Eurostat (Eurostat (n.d.))

## 3. Stata programs for data analysis

All analysis was performed using Stata 15. User-written programs called upon by these do files include:

- matsave
- estout
- reghdfe

The following lists the .do files used to perform the analysis in the paper and the Appendix, the .dta files each .do file calls on, along with the tables and figures sourced from each file.

1. pq\_sumstats.do
  - Uses exports\_newcn.dta [CONFIDENTIAL], cip\_ex\_prodcom.dta [CONFIDENTIAL]
  - Calculates summary statistics:
    - Table 1 in the paper
    - Table 2 in the paper
    - Table 5 in the Appendix
2. pq\_dynamics\_prodmkt\_0.do
  - Uses exports\_newcn.dta [CONFIDENTIAL], cip\_ex\_prodcom.dta [CONFIDENTIAL]
  - Uses bilat\_distance.dta
  - Coefficients to form Figure 1 in the paper
  - Coefficients to form Figure 2 in the paper
  - Coefficients to form firm-product-market exit hazard in Figure 3 in the paper
  - Table 6 in the paper, column 5
  - Table 7 in the paper, column 5

- Table 9 in the Appendix, columns 1, 2, 3
- Table 10 in the Appendix
- Table 11 in the Appendix
- Table 12 in the Appendix
- Table 15 in the Appendix, column 1
- Table 16 in the Appendix
- Table 18 in the Appendix, column 1, row 1, column 1, row 2
- Table 19 in the Appendix
- Table 20 in the Appendix
- Table 25 in the Appendix, column 1, row 1
- Table 26 in the Appendix, columns 1,2,3
- Table 27 in the Appendix, column 1
- Table 28 in the Appendix, column 1
- Table 29 in the Appendix
- Table 30 in the Appendix
- Table 31 in the Appendix

### 3. pq\_dynamics\_prodmkt\_1.do

- Uses exports\_newcn.dta [CONFIDENTIAL], cip\_ex\_prodcom.dta [CONFIDENTIAL], exports\_newcn14.dta [CONFIDENTIAL]
- Uses bilat\_distance.dta
- Uses avgdpsh.dta
- Section 5 of the paper: correlation between  $\{\bar{m}^i, \bar{f}^k\}$
- Section 5.1 in the paper: where the means of  $\{\bar{m}^i, \bar{f}^k\}$  across all observations sit in terms of distributions of these variables
- Section 5.3 in the paper: R-squared for quantity and price regressions using only firm-prod-year and mkt-prod-year fixed effects as controls
- Table 3 from the paper
- Table 4 from the paper: columns 3, 4
- Table 5 from the paper
- Table 6 in the paper: Columns 1,2,3,4
- Table 7 in the paper Columns 1,2,3,4
- Table 7 from the Appendix, columns 1,2,5,6

- Table 8 in the Appendix: Columns 1, 2, 4
- Table 23 in the Appendix, columns 1,2,3
- Table 24 in the Appendix, column 1
- Table 25 in the Appendix, column 1, row 2
- Table 32 in the Appendix, columns 1,2,3
- Table 33 in the Appendix, columns 1,2,3
- Table 34 in the Appendix, columns 1,2,3
- Table 35 in the Appendix, columns 1,2,3
- Table 36 in the Appendix, column 1
- Table 37 in the Appendix
- Table 38 in the Appendix
- Tables 39, 41, 43, 45 in the Appendix, columns 1,2,3
- Tables 40, 42, 44, 46 in the Appendix, column 1
- Tables 47, 49 in the Appendix, columns 1,2,3
- Tables 48, 50 in the Appendix, column 1
- Tables 51, 53 in the Appendix, columns 1,2,3
- Tables 52, 54 in the Appendix, column 1
- Table 55 in the Appendix
- Table 56 in the Appendix
- Table 58 in the Appendix
- Table 59 in the Appendix
- Table 60 in the Appendix

#### 4. pq\_dynamics\_mkt\_0.do

- Uses exports\_newcn.dta [CONFIDENTIAL], cip\_ex\_prodcom.dta [CONFIDENTIAL]
- Uses bilat\_distance.dta
- Coefficients to form firm-market exit hazard in Figure 3 in the paper
- Table 9 in the Appendix, columns 4,5
- Table 13 in the Appendix
- Table 14 in the Appendix
- Table 15 in the Appendix, column 2

- Table 17 in the Appendix
- Table 18 in the Appendix, column 2
- Table 21 in the Appendix
- Table 22 in the Appendix
- Table 26 in the Appendix, columns 4,5
- Table 27 in the Appendix, column 2
- Table 28 in the Appendix, column 2

5. pq\_dynamics\_mkt\_1.do

- Uses exports\_newcn.dta [CONFIDENTIAL], cip\_ex\_prodcom.dta [CONFIDENTIAL], exports\_newcn14.dta [CONFIDENTIAL]
- Uses bilat\_distance.dta
- Uses avgdps.sh.dta
- Table 4 in the paper, columns 1,2
- Table 7 in the Appendix, columns 3,4
- Table 8 in the Appendix, Columns 3,5
- Table 23 in the Appendix, columns 4,5
- Table 24 in the Appendix, column 2
- Table 25 in the Appendix, column 2
- Table 32 in the Appendix, columns 4,5
- Table 33 in the Appendix, columns 4,5
- Table 34 in the Appendix, columns 4,5
- Table 35 in the Appendix, columns 4,5
- Table 36 in the Appendix, column 2
- Tables 39, 41, 43, 45, columns 4,5
- Tables 40, 42, 44, 46 in the Appendix, column 2
- Tables 47, 49 in the Appendix, columns 4,5
- Tables 48, 50 in the Appendix, column 2
- Tables 51, 53 in the Appendix, columns 4,5
- Tables 52, 54 in the Appendix, column 2

6. price\_facts.do



- Uses exports\_newcn.dta [CONFIDENTIAL], cip\_ex\_prodcom.dta [CONFIDENTIAL]
  - Uses gravdata\_price\_facts.dta
  - Table 57 in the Appendix
7. pq\_dynamics\_prod.do,
- Uses cip\_ex\_prodcom.dta [CONFIDENTIAL], prep\_prodcom\_data\_150430.dta [CONFIDENTIAL]
  - Table 61 in the Appendix

## 4. External data files used with confidential data

We use external data contained in four files made available in this packet:

1. cpi.xls
  - Data on the Consumer Price Index taken from the CSO Statbank (Central Statistics Office, Ireland (CSO) (2023)). Used to deflate all nominal values in the data.
2. bilat\_distance.dta
  - Data on bilateral distance by partner country. Taken from CEPII (see CEPII (2011) and Mayer and Zignago (2011)).
3. avgdps.dta (country, avgdps, lavgdps, check source) share of world gdp (av over 1996-2014) at country level
  - Data on average share of world GDP over 1996-2014 by partner country. Based on data from World Development Indicators (The World Bank (2023)).
4. gravdata\_price\_facts.dta
  - Data on bilateral distance, annual GDP, annual GDP per capita and remoteness constructed using GDP and bilateral distance. Taken from CEPII (see CEPII (2011), Mayer and Zignago (2011), CEPII (2022), Conte et al (2022), The World Bank (2023)).

## 5. Matlab programs

We use Matlab R2016a to perform the quantitative analysis reported in the paper and in the Appendix. Our code makes use of the following toolboxes, also from R2016a:

- Global optimization
- Optimization
- Parallel Computing
- Statistics and Machine Learning

## 5.1 Main estimation

This folder contains the following .m files:

1. main\_smm\_nested.m

- Code used to estimate the baseline (nested) model with the baseline moments using a combination of particle swarm and pattern search. This file calls on objective\_nested\_TE3.m (and therefore also rouwenhorst.m), which must be saved in an appropriate location. This code can be used to estimate restricted versions of the model as described in the preamble to the code.

2. objective\_nested\_TE3.m

- Objective function used to estimate the baseline (nested) model with the baseline moments. This file calls on rouwenhorst.m, which must be saved in an appropriate location.

3. rouwenhorst.m

- Code to approximate AR(1) process using the Rouwenhorst method as in Kopecky and Suen (2010).

4. plotting\_output.m

- Code to generate Figures 5, 6, 7, 8 in the paper, and to calculate the functions of  $F$  and  $\underline{D}$  reported in Table 8 in the paper.
- This file calls on rouwenhorst.m, which must be saved in an appropriate location.
- This file also calls on x\_best\_psi\_1.mat

This folder also contains the following .mat file:

1. x\_best\_psi\_1.mat

- This mat file contains the vector of parameters which was the outcome of our search procedure to minimize the distance between data and model moments, i.e. the “best” parameter vector that we found.

## 5.2 Bootstrap

This folder contains the following .m files:

1. `main_smm_bootstrap.m`
  - This file implements the bootstrap. It takes as input the vector of best parameters from the main estimation (`x_best_psi_1.mat`). In each iteration, it uses `objective_nested_TE3_gen_moments.m` together with the vector of best parameters and a new seed for simulation to generate a new set of target moments. `objective_nested_TE3.estimate.m` is then called on to estimate a new vector `x` that yields the best fit to the new set of target moments. This last step uses yet another seed for the simulation stage. Both `objective_nested_TE3_gen_moments.m` and `objective_nested_TE3.estimate.m` call on `rouwenhorst.m`.
2. `objective_nested_TE3_gen_moments.m`
  - This file is used together with the vector of best parameters and a new seed for simulation to generate a new set of target moments.
3. `objective_nested_TE3.estimate.m`
  - This file estimates a new vector `x` that yields the best fit to the new set of target moments. Note that  $\psi = 1$  is imposed in this exercise.
4. `bootstrap_results.m`
  - This file calculates the bootstrapped standard errors reported in Table 8 in the paper based on 171 rounds of the parametric bootstrap. It also generates Figure 51 from the Appendix illustrating the distribution of bootstrapped estimates. Calls on `bootstrap_output.mat`.
5. `rouwenhorst.m`
  - Code to approximate AR(1) process using the Rouwenhorst method as in Kopecky and Suen (2010).

This folder also contains the following .mat file:

1. `x_best_psi_1.mat`
  - This mat file contains the vector of parameters which was the outcome of our search procedure to minimize the distance between data and model moments, i.e. the “best” parameter vector that we found.
2. `bootstrap_output.mat`
  - This mat file contains the 171 bootstrapped estimates of the model along with the baseline estimate.

## 5.3 Parameter robustness

This folder contains the following .m files:

1. psi\_robustness.m
  - Code to generate Figure 4 in the paper, i.e. model fit for different values of  $\psi$ . This code also generates Figures 52-75 and 116-118 in the Appendix. It calls on objective\_nested\_TE3\_moments.m, objective\_nested\_TE3\_altgrid\_moments.m, objective\_nested\_TE3\_quantity\_moments.m, objective\_nested\_TE3\_price\_moments.m, objective\_nested\_TE3\_exit\_moments.m, x\_best\_psi\_fixed\_values\_1.mat and x\_best\_psi\_fixed\_values\_2.mat.
2. objective\_nested\_TE3\_moments.m
  - Objective function used to calculate fit of different moments using the baseline approach to constructing the grid for customer base. This file calls on rouwenhorst.m, which must be saved in an appropriate location.
3. objective\_nested\_TE3\_altgrid\_moments.m
  - Objective function used to calculate fit of different moments using an alternative approach to constructing the grid for customer base. This file calls on rouwenhorst.m, which must be saved in an appropriate location.
4. objective\_nested\_TE3\_quantity\_moments.m
  - Objective function used to calculate quantity moments using the baseline approach to constructing the grid for customer base. This file calls on rouwenhorst.m, which must be saved in an appropriate location.
5. objective\_nested\_TE3\_price\_moments.m
  - Objective function used to calculate price moments using the baseline approach to constructing the grid for customer base. This file calls on rouwenhorst.m, which must be saved in an appropriate location.
6. objective\_nested\_TE3\_exit\_moments.m
  - Objective function used to calculate exit moments using the baseline approach to constructing the grid for customer base. This file calls on rouwenhorst.m, which must be saved in an appropriate location.
7. rouwenhorst.m
  - Code to approximate AR(1) process using the Rouwenhorst method as in Kopecky and Suen (2010).

8. other\_parameter\_robustness.m

- Code to generate Figures 76-115 in the Appendix. It calls on alphamat.mat, deltammat.mat, phimat.mat, signumat.mat, sigetamat.mat, rhomat.mat, gammamat.mat and pooledmat.mat.

This folder also contains the following .mat files:

1. x\_best\_psi\_fixed\_values\_1.mat

- This mat file contains the vectors of parameters used to construct Figure 4 in the paper.

2. x\_best\_psi\_fixed\_values\_2.mat

- This mat file contains the vectors of parameters used together with x\_best\_psi\_fixed\_values\_1. to construct Figure 52 in the Appendix.

3. alphamat.mat

- Contains estimates of the baseline model restricting  $\alpha$ , along with corresponding model fit, and also the best estimates of the model along with fit.

4. deltammat.mat

- Contains estimates of the baseline model restricting  $\delta$ , along with corresponding model fit, and also the best estimates of the model along with fit.

5. phimat.mat

- Contains estimates of the baseline model restricting  $\phi$ , along with corresponding model fit, and also the best estimates of the model along with fit.

6. signumat.mat

- Contains estimates of the baseline model restricting  $\sigma_\nu$ , along with corresponding model fit, and also the best estimates of the model along with fit.

7. sigetamat.mat

- Contains estimates of the baseline model restricting  $\sigma_\eta$ , along with corresponding model fit, and also the best estimates of the model along with fit.

8. rhomat.mat

- Contains estimates of the baseline model restricting  $\rho$ , along with corresponding model fit, and also the best estimates of the model along with fit.

9. gammamat.mat

- Contains estimates of the baseline model restricting  $\gamma$ , along with corresponding model fit, and also the best estimates of the model along with fit.

10. pooledmat.mat

- This mat file pools together the parameter estimates in x\_best\_psi\_fixed\_values\_2.mat, alphamat.mat, deltam.mat, phimat.mat, signumat.mat, sigetamat.mat, rhomat.mat, gammamat.mat along with fit of the model along various dimensions for these parameter values. The parameter vectors are restricted to those where  $\psi > 0.96$ .

## 5.4 Simulations

This folder contains the following .m files:

1. propositions\_support.m

- Code that provides numerical support for extensions of propositions 1-4 from Section 2.1 of the paper. This code also verifies that the proxies for marginal cost, market size and idiosyncratic demand used in the reduced form empirical strategy behave as conjectured in Section 4 of the paper under our baseline parameterization of the model. Both of these analyses are described in detail in Section D.3 of the Appendix. This code generates Figures 1, 2, and 3 in the Appendix.

2. rouwenhorst.m

- Code to approximate AR(1) process using the Rouwenhorst method as in Kopecky and Suen (2010).

This folder also contains the following .mat files:

1. x\_best\_psi\_1\_extended.mat

- This mat file contains the vector of parameters which was the outcome of our search procedure to minimize the distance between data and model moments, i.e. the “best” parameter vector that we found. In addition, it contains parameters for the cost, market size and sunk cost distributions for the augmented model in propositions\_support.m.

2. x\_best\_psi\_0\_extended.mat

- This mat file contains the vector of parameters which minimize the distance between data and model moments conditional on  $\psi = 0$ . In addition, it contains parameters for the cost, market size and sunk cost distributions for the augmented model in propositions\_support.m.

## 5.5 Application

This folder contains the following .m files:

1. trade\_cost\_impulseresponses.m

- This file generates impulse-responses of incumbents to different types of trade cost shocks for parameter vectors with  $\psi = 1$  and  $\psi = 0$ . It generates Figure 9 in the paper and Figures 125-130 in the Appendix. This file calls on rouwenhorst.m, x\_best\_psi\_1\_short.mat and x\_best\_psi\_0\_short.mat.

2. rouwenhorst.m

- Code to approximate AR(1) process using the Rouwenhorst method as in Kopecky and Suen (2010).

It also contains the following .mat files:

1. x\_best\_psi\_1\_short.mat

- This mat file contains a subset of the vector of parameters which minimize the distance between data and model moments, i.e. the “best” parameter vector that we found.

2. x\_best\_psi\_0\_short.mat

- This mat file contains a subset of the vector of parameters which minimize the distance between data and model moments conditional on  $\psi = 0$ .

## 5.6 Unrestricted theta

This folder contains the following .m files:

1. smm\_unrestricted\_theta.m

- Code used to estimate a customer markets model with unrestricted  $\theta$  using a combination of particle swarm and pattern search. This file calls on objective\_unrestricted\_theta.m (and therefore also rouwenhorst.m), which must be saved in an appropriate location.

2. objective\_unrestricted\_theta.m

- Objective function used to estimate a customer markets model with unrestricted  $\theta$  with the baseline moments. This file calls on rouwenhorst.m, which must be saved in an appropriate location.

3. rouwenhorst.m

- Code to approximate AR(1) process using the Rouwenhorst method as in Kopecky and Suen (2010).

4. plotting\_output\_unrestricted\_theta.m

- Code to generate Figures 119-121 in the Appendix, and to calculate the functions of  $F$  and  $\underline{D}$  reported in Table 65 in the Appendix.
- This file calls on rouwenhorst.m, which must be saved in an appropriate location.
- This file also calls on x\_best\_psi\_0\_unrestricted\_theta.mat

It also contains the following .mat files:

1. x\_best\_psi\_0\_unrestricted\_theta.mat

- This mat file contains the vector of parameters which was the outcome of our search procedure to minimize the distance between data moments and moments generated by the customer markets model with unrestricted  $\theta$ .

## 5.7 Learning model

This folder contains the following .m files:

1. smm\_bayes\_setqty.m

- Code used to estimate the learning about demand model where firms set quantities described in Appendix C. This file calls on objective\_bayes\_setqty.m (and therefore also rouwenhorst.m), which must be saved in an appropriate location.

2. objective\_bayes\_setqty.m

- Objective function used to estimate the learning about demand model where firms set quantities described in Appendix C. This file calls on rouwenhorst.m, which must be saved in an appropriate location.

3. rouwenhorst.m

- Code to approximate AR(1) process using the Rouwenhorst method as in Kopecky and Suen (2010).

4. plotting\_output\_bayes\_setqty.m

- Code to generate Figures 122-124 in the Appendix, and to calculate the function of  $F$  reported in Table 66 in the Appendix.
- This file calls on rouwenhorst.m, which must be saved in an appropriate location.
- This file also calls on x\_best\_learn.mat



It also contains the following .mat files:

1. x\_best\_learn.mat
  - This mat file contains the vector of parameters which was the outcome of our search procedure to minimize the distance between data moments and moments generated by the learning about demand model where firms set quantities.

## Where tables & figures come from

### 6.1 Paper

#### 6.1.1 Tables

1. Summary statistics: Firms and exports, averages 1996-2009
  - stata/do files/pq\_sumstats.do
2. Percentage of exporters by change in number of markets year to year
  - stata/do files/pq\_sumstats.do
3. Correlations of  $m^i$  and  $f^k$  with employment, GDP and distance
  - stata/do files/pq\_dynamics\_prodmkt\_1.do
4. Distribution of duration: Export spells and export observations
  - Columns 1, 2: stata/do files/pq\_dynamics\_mkt\_1.do
  - Columns 3, 4: stata/do files/pq\_dynamics\_prodmkt\_1.do
5. Regression of duration on  $m^i$  and  $f^k$ 
  - stata/do files/pq\_dynamics\_prodmkt\_1.do
6. Building our specification: Quantity
  - Columns 1,2,3,4: stata/do files/pq\_dynamics\_prodmkt\_1.do
  - Column 5: stata/do files/pq\_dynamics\_prodmkt\_0.do
7. Building our specification: Price
  - Columns 1,2,3,4: stata/do files/pq\_dynamics\_prodmkt\_1.do
  - Column 5: stata/do files/pq\_dynamics\_prodmkt\_0.do
8. Structural model: parameter estimates conditional on  $\psi = 1$ 
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## 6.2 Appendix

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  7. Dynamics of quantities: baseline vs conditional on  $\ln m^i$  and  $\ln f^k$ 
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  17. Dynamics of quantities: Long sample, topcoding at 10
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24. Dynamics of quantities: Consumer food

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- Baseline: stata/do files/pq\_dynamics\_prodmkt\_0.do
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35. Exit hazard: Capital goods

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78. Quantity fit for all values of  $\alpha$
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79. Exit and entry fit for all values of  $\alpha$
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81. Fit for all values of  $\delta$
- matlab/parameter\_robustness/other\_parameter\_robustness.m
82. Quantity fit for all values of  $\delta$
- matlab/parameter\_robustness/other\_parameter\_robustness.m

83. Exit and entry fit for all values of  $\delta$ 
  - matlab/parameter\_robustness/other\_parameter\_robustness.m
84. Fit for fixed values of  $\phi$ 
  - matlab/parameter\_robustness/other\_parameter\_robustness.m
85. Fit for all values of  $\phi$ 
  - matlab/parameter\_robustness/other\_parameter\_robustness.m
86. Quantity fit for all values of  $\phi$ 
  - matlab/parameter\_robustness/other\_parameter\_robustness.m
87. Exit and entry fit for all values of  $\phi$ 
  - matlab/parameter\_robustness/other\_parameter\_robustness.m
88. Fit for fixed values of  $\sigma_\nu$ 
  - matlab/parameter\_robustness/other\_parameter\_robustness.m
89. Fit for all values of  $\sigma_\nu$ 
  - matlab/parameter\_robustness/other\_parameter\_robustness.m
90. Quantity fit for all values of  $\sigma_\nu$ 
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91. Exit and entry fit for all values of  $\sigma_\nu$ 
  - matlab/parameter\_robustness/other\_parameter\_robustness.m
92. Fit for fixed values of  $\sigma_\eta$ 
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93. Fit for all values of  $\sigma_\eta$ 
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97. Fit for all values of  $\rho$
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98. Quantity fit for all values of  $\rho$
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99. Exit and entry fit for all values of  $\rho$
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101. Fit for all values of  $\gamma$
- matlab/parameter\_robustness/other\_parameter\_robustness.m
102. Quantity fit for all values of  $\gamma$
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103. Exit and entry fit for all values of  $\gamma$
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105. Quantity fit for all values of  $\omega$
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106. Exit and entry fit for all values of  $\omega$
- matlab/parameter\_robustness/other\_parameter\_robustness.m
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109. Exit and entry fit for all values of  $\lambda$ 
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