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EU Enlargement and the New Goods Margin in Austrian Trade^{*}

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Abstract

Using the methodology developed in Kehoe and Ruhl (2013), I measure the change in the extensive, or new goods, margin of trade between Austria and the ten new entrants to the European Union in 2004. On average, the new goods account for 42% of the bilateral trade flow after enlargement. A time series measure shows growth in the new goods margin coincides with the 2004 enlargement, which provides evidence on the importance of the role played by the new goods margin in the growth in trade following a trade liberalization.

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1 Introduction

The 2004 enlargement of the European Union (EU) represents a major step in solidifying the reintegration of Western and Eastern Europe after the end of the Cold War. Along with eight Central and Eastern European countries (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia), two Mediterranean countries (Malta and Cyprus) joined the EU on May 1, 2004.¹ The 2004 enlargement differs from other enlargements of the EU in some important respects. In terms of population and number of countries, the 2004 enlargement is the largest ever undertaken by the EU. The 2004 enlargement also shifts the EU's center of gravity eastward. The trade liberalization portion of enlargement represents a significant policy change with implications for the patterns of international trade, especially between existing EU member countries prior to 2004 and those new entrants to the EU. The large differences between the economies of the old members and new entrants suggest the potential for significant trade growth. Trade growth occurs along either the intensive or extensive margin. In this paper, I study the effects of the 2004 enlargement on the growth in trade along the extensive margin.²

In particular, I take Austria as my point of reference and measure the extensive margin of trade between Austria and the ten expansion countries. Thinking in terms of a simple gravity model, Austria is a natural candidate to consider for trade growth after the trade liberalization because of its close proximity to the expansion countries. Out of all the existing members of the EU before enlargement, Austria shares a border with the most countries, four out of ten, joining the EU in 2004 and is close geographically to the other entrants. Austria and its four bordering entrants also share a close cultural and political history through their experience in the Austro-Hungarian Empire, which may provide for a shorter distance, again in a gravity model sense, between these countries and greater potential for trade after a trade liberalization. For these reasons, trade between Austria and the EU entrants provides a good case for studying the role played by the extensive margin after a trade liberalization.

I measure the change in the extensive margin in the twenty bilateral trade flows, exports and

¹Bulgaria and Romania would join later on January 1, 2007. I only consider the countries admitted during the 2004 enlargement in this paper's analysis.

²There is also a literature focused on the role played by the adoption of the euro in the growth in trade, including growth along the extensive margin. See, for example, Baldwin and Di Nino (2006), Flam and Nordström (2006), and Berger and Nitsch (2008).

imports, between Austria and the 2004 entrants to the EU using the methodology developed in Kehoe and Ruhl (2013). Using goods-level data, growth in the extensive margin occurs when previously non-traded goods become traded. I adopt the terminology in Kehoe and Ruhl (2013) and refer to this extensive margin as the *new qoods margin*. I uncover four main findings in my analysis of the Austrian trade data. First, significant growth occurs in the new goods margin in all twenty bilateral trade flows. The new goods range from accounting for 21% (Austrian exports to Slovenia) to 91% (Austrian imports from Cyprus) of the trade flow after EU enlargement. On average, the new goods account for 42% of the trade flow after liberalization. Second, this growth coincides with the enlargement of the EU in 2004. This result shows enlargement has a clear impact on the new goods margin of trade, even though trade in goods between the EU and the 2004 entrants faced fewer restrictions after the passing of the so-called *Europe Agreements* in the 1990s. Egger and Larch (2011) shows the partial elimination of tariffs as a part of the Europe Agreements did facilitate trade growth between the EU and the 2004 entrants. My results show the 2004 enlargement had a further significant effect on the new goods margin. Third, growth in the new goods margin is higher for Austrian imports from the EU expansion countries than it is for Austrian exports to these countries. Fourth, on average, the magnitude of the growth in the new goods margin is higher for those trade flows between Austria and the EU entrants not sharing a border with Austria than between Austria and its immediate neighbors.

My results directly expand those in Kehoe and Ruhl (2013) by considering a major trade liberalization episode not included in the authors' analysis. Kehoe and Ruhl (2013) does consider the effects on the new goods margin from the passing of the North American Free Trade Agreement (NAFTA) and China's accession to the World Trade Organization (WTO). The authors find significant evidence for growth in the new goods margin following these trade liberalization episodes. For the case of Austrian trade, the magnitudes of the growth in the new goods margin are similar to or greater than the magnitudes after the trade liberalizations considered by Kehoe and Ruhl (2013). My results strengthen those in Kehoe and Ruhl (2013) by providing further evidence showing the importance of the new goods margin. My experiment is also cleaner than the NAFTA experiment in Kehoe and Ruhl (2013), because the sample period I consider is unaffected by the data discontinuity problems identified by Kehoe and Ruhl (2013).³ These

³Please see the appendix in Kehoe and Ruhl (2013) for a thorough discussion of this point.

empirical findings matter for international economists and policy-makers. The findings suggest models in which the extensive margin plays a significant role may be better suited for studying the effects of trade liberalization on the patterns of a country's trade. Those parties interested in the effects of the 2004 EU enlargement, for example, would have been ill prepared for what actually occurred if they relied on analysis only considering the intensive margin.

In the case of Costa Rica, Arkolakis, Demidova, Klenow, and Rodríguez-Clare (2008) finds growth in imported varieties coincides with a period of trade liberalization. Using the methodology developed in Kehoe and Ruhl (2013), Sandrey and van Seventer (2004), Mukerji (2009), and Dalton (2013) all document growth in the new goods margin after trade liberalizations. Sandrey and van Seventer (2004) considers trade liberalization between Australia and New Zealand. New goods account for 29.5% of New Zealand exports to Australia and 21.9% of Australian exports to New Zealand after trade barriers decrease. Mukerji (2009) finds India's unilateral trade liberalization resulted in new goods accounting for 33.8% and 26.5% of total imports and exports, respectively. Dalton (2013) shows new goods account for 22% of Chinese exports to Japan after China joins the WTO. The composition of Japanese exports to China underwent a much smaller change, however. New goods only account for 15.9% of Japanese exports to China after China joins the WTO.

I organize the remainder of the paper as follows: Section 2 describes the Kehoe and Ruhl (2013) methodology used in the analysis. I report the results in section 3. Section 4 concludes.

2 Kehoe and Ruhl (2013) Methodology

I follow the procedure developed in Kehoe and Ruhl (2013) to measure the extensive margin in Austrian trade at the goods-level, the so-called new goods margin. The goods data are annual trade flow data between Austria and the ten entrants to the EU measured as 4-digit SITC Revision 2 codes, i.e. I consider each 4-digit code a good. One of the strengths of this approach is that data are readily available for a large number of countries. The data I use on Austria and the EU entrants are from the OECD's *ITCS International Trade by Commodity Database*. Since growth in the extensive margin of trade measures when goods switch from being non-traded to traded from one period to the next, what it means for a good to be non-traded in the 4-digit codes data needs to be defined. Feenstra (1994), Hummels and Klenow (2005), and Broda and Weinstein (2006) define goods with a trade value of \$0 as non-traded, whereas Evenett and Venables (2002) sets a cut-off of \$50,000 or below. As Kehoe and Ruhl (2013) points out, however, applying a fixed cut-off generates a number of concerns. Customs officials often do not require firms to report small value shipments, so zeros in the trade flow data might not actually reflect the true trade flow. Large countries report fewer zeros due purely to size. Applying the same fixed cut-off across countries does not account for differences in the relative importance of a good in a country's trade. Instead of using a fixed cut-off, Kehoe and Ruhl (2013) allows the dollar value of the cut-off to vary across countries by defining non-traded goods by their relative importance, or unimportance, in a country's trade.

In order to analyze the new goods margin over a particular sample period for a bilateral trade flow, I follow Kehoe and Ruhl (2013) and partition the 4-digit codes data into ten bins, each representing 10% of the value of the total trade flow at the beginning of the sample period. Some codes are split across bins to exactly match 10% of the trade flow. By ordering the codes from smallest to largest trade value and then cumulating the codes, the first bin of codes represents the set of *least-traded goods*. Least-traded goods can include goods reported with zero trade value or goods traded in some positive amount. The set of least-traded goods defined in this way is the analogue in Kehoe and Ruhl (2013) of the set of non-traded goods determined by a fixed cut-off. The ordering of the codes is not sensitive to the choice of the base year, because I order the codes based on the average trade of the first three years of the sample period. Kehoe and Ruhl (2013) analyzes the data in two ways. The first measures the trade share of each bin at the beginning, by definition 10%, and end of the sample period, which shows how the distribution of goods in the trade flow changes over time. The second tracks the trade share of the set of least-traded goods over the entire sample period, which captures changes in the new goods margin. This time series measure is useful for identifying the impact of shocks or policy changes, such as trade liberalizations, on the new goods margin.

3 Results

I organize my analysis of Austrian trade with the EU entrants around such a change, namely the 2004 enlargement of the EU. In order to identify the effects of EU entrance, I define the sample period as 1999-2009, five years before and after the year of enlargement. This sample period is similar in length to the sample periods considered in Kehoe and Ruhl (2013). My experiment, however, is cleaner than the NAFTA liberalization studied by Kehoe and Ruhl (2013), because my sample period is unaffected by the data discontinuity associated with the adoption of the Harmonized System in the late 1980s. Kehoe and Ruhl (2013)'s preliberalization sample is shorter, because the NAFTA data is affected by the discontinuity. The length of my sample period allows me to better identify the effects of trade liberalization on the new goods margin.

I discuss my results by considering, first, exports to and, second, imports from the four EU entrants sharing a border with Austria (Czech Republic, Hungary, Slovakia, and Slovenia). These countries represent four of the top five trading partners by volume out of the ten EU entrants, Poland being the fifth country in the top five. I then present a condensed version of the results for the trade flows between Austria and the remaining EU entrants (Cyprus, Estonia, Latvia, Lithuania, Malta, and Poland).

3.1 Austrian Exports to Border Countries

I begin by analyzing how the distribution of goods in Austrian exports changes over time. Figures 1 - 4 show the changes from 1999 to 2009 in the distribution of goods being exported from Austria to the Czech Republic, Hungary, Slovakia, and Slovenia. The x-axes measure the cumulative fraction of the 1999 export value. Each of the bars coincides with a bin consisting of goods ordered based on the average trade value for the years 1999-2001. Since each bin represents exactly 10% of the 1999 export value, cumulating from left to right always increases the fraction by 0.1. Of course, the set of least-traded goods is then the first bar. The y-axes measure the fraction of 2009 export value. The horizontal black lines at 0.10 show the height of each bar had there been no changes to the distribution of goods from 1999 to 2009. The number over each bar designates the number of goods in each bin. The results in Kehoe and Ruhl (2013) suggest the set of least-traded goods typically consists of a large number of goods. The least-traded goods in Austrian exports to its border countries are consistent with this finding. Given the large number of least-traded goods, there is potential for large growths in trade along the new goods margin.

A clear pattern emerges from figures 1 - 4: significant growth along the new goods margin occurs. The set of least-traded goods grows from 10% of Austrian exports in 1999 to 22.3% (Czech Republic), 26.6% (Hungary), 25% (Slovakia), and 21.1% (Slovenia) in 2009. Overall, figures 1 - 4 suggest growth in the share of those goods traded less. Only four out of the fifteen bins experiencing growth were the seventh bin or higher. The other eleven bins experiencing growth were all from the first four bins. The four sets of least-traded goods, however, experienced the most growth.

Figures 1 - 4 say nothing about the specific timing of the growth in the new goods margin in Austrian exports to its border countries. Figure 5, however, tracks the change in the share of least-traded goods in each of the four bilateral trade flows. The vertical dotted line at the year 2004 marks the EU enlargement. The enlargement occurred during the first half of the year on May 1, 2004, so there was plenty of time for the policy change to generate a noticeable difference beginning with the 2004 data points, something which is evident in figure 5. The figure suggests EU enlargement coincided with an immediate impact on the growth of the set of least-traded goods. In all cases except the Czech Republic, however, the share of least-traded goods declined in 2005 but continued to grow shortly thereafter. The timing of the impact of EU enlargement on the new goods margin in Austrian exports is consistent with the findings in Kehoe and Ruhl (2013). Kehoe and Ruhl (2013) finds the increase in the shares of least-traded goods in Canadian exports to Mexico and Mexican exports to Canada coincides with the implementation of NAFTA in 1994, for example. The overall growth in the shares of least-traded goods in Austrian exports is also comparable with the magnitudes of growth seen in the bilateral trade flows between the pairs of NAFTA countries. Based on the analysis of Austrian exports to its border countries, the new goods margin already seems to have played an important role in changing trade flows after EU enlargement. I now turn to examining Austrian imports from its border countries.



Figure 1: Composition of Exports: Austria to Czech Republic



Figure 2: Composition of Exports: Austria to Hungary



Figure 3: Composition of Exports: Austria to Slovakia



Figure 4: Composition of Exports: Austria to Slovenia



Figure 5: Austrian Exports to Border Countries

3.2 Austrian Imports from Border Countries

Figures 6 - 9 show the same measure of the distribution of goods for the case of Austrian imports as figures 1 - 4 do for exports. The pattern emerging from Austrian imports from its border countries is similar to its exports in that the set of least-traded goods experiences significant growth. The least-traded goods grow from 10% of Austrian imports in 1999 to 24% (Czech Republic), 23.2% (Hungary), 45.1% (Slovakia), and 25% (Slovenia) in 2009. There are noticeable differences between the Austrian export and import flows. Growth in the least-traded goods from the Czech Republic, Slovakia, and Slovenia exceeds the corresponding growth in the least-traded exports from Austria to these countries, whereas the reverse is true for Hungary. The magnitudes of the growth for the export and import flows are still fairly similar, though, in the cases of the Czech Republic, Hungary, and Slovenia. The growth in the least-traded goods in Austrian imports from Slovakia is an exception, being nearly twice as large as any of the other growth levels. The last difference between the Austrian export and import flows

corresponds to the number of goods in the sets of least-traded goods. In the cases of the Czech Republic, Slovakia, and Slovenia, the number of least-traded goods in Austrian imports from these countries exceeds that in Austrian exports. Again, Hungary is an exception. The number of least-traded goods in Austrian imports from Hungary appears quite low relative to the other trade flows, less than 50% of the number of least-traded goods in the other flows.

In general, comparing figures 1 - 4 with figures 6 - 9 suggests two main potential differences between the sets of least-traded goods in Austrian exports and imports. First, the growth in least-traded goods is greater for Austrian imports. Second, the number of least-traded goods is larger for Austrian imports. It turns out Hungary is the only exception to these two general results out of all the EU enlargement countries, not just out of the countries bordering Austria. I confirm these results for the other EU enlargement countries in section 3.3.

Turning to the impact of EU enlargement on the new goods margin in Austrian imports, figure 10 tracks the share of least-traded goods over the period 1999-2009. The effects of EU enlargement appear far less uniform across the border countries in the case of Austrian imports than in the case of Austrian exports appearing in figure 5. The shares of least-traded goods all increase in 2004, the year of enlargement, but the movements are less identifiable as being clearly the result of the policy change. The share of least-traded goods in imports from Hungary, for example, seems to continually trend upwards over the period with no clearly discernable deviation from trend as a result of the policy change. The share of least-traded goods in imports from the Czech Republic, on the other hand, does experience a level shift in 2004. Slovenia experiences a big jump in the share of least-traded goods in 2004 but then the share drops down. Only during the last three years of the period does the share continue to increase. The share of least-traded goods in imports from Slovakia increases by the most, but the increase begins in earnest several years before EU enlargement. The growth in the share does accelerate in the year following EU enlargement. Although figure 10 may suggest the immediate effect of EU enlargement in 2004 is less clear and identifiable across countries when viewed from the perspective of Austrian imports, the results presented in figure 10 on the whole are still consistent with the move towards greater integration and trade liberalization over the period considered. Growth along the new goods margin clearly occurred during the period surrounding EU enlargement.



Figure 6: Composition of Exports: Czech Republic to Austria



Figure 7: Composition of Exports: Hungary to Austria



Figure 8: Composition of Exports: Slovakia to Austria



Figure 9: Composition of Exports: Slovenia to Austria



Figure 10: Border Country Exports to Austria

3.3 Austrian Trade with the Remaining EU Entrants

The growth in trade along the new goods margin between Austria and the remaining EU entrants (Cyprus, Estonia, Latvia, Lithuania, Malta, and Poland) resembles the pattern between Austria and its border countries but is of a much higher magnitude. Tables 1 and 2 present the evolution of the shares of least-traded goods in Austrian exports to and imports from the remaining EU entrants. As reference, I also include the shares of least-traded goods from figures 5 and 10 for Austrian trade with the border countries. Both Austrian exports to and imports from the remaining EU entrants experience significant growth along the new goods margin. Table 1 shows the sets of least-traded goods grow from 10% of Austrian exports in 1999 to 39.7% (Cyprus), 43.9% (Estonia), 34.1% (Latvia), 40.6% (Lithuania), 24.7% (Malta), and 24.7% (Poland) in 2009, reaching a mean of 34.6% across the countries in 2009. This compares with a mean of 23.8% in 2009 for the set of least-traded goods in Austrian exports to its border countries. Austrian imports experience even larger growth in the new goods margin than Austrian exports, which

Austrian Exports to											
Year	Cyprus	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Malta	Poland	Slovakia	Slovenia	
1999	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
2000	0.08	0.09	0.09	0.09	0.12	0.09	0.09	0.09	0.10	0.08	
2001	0.07	0.09	0.10	0.10	0.09	0.10	0.05	0.09	0.09	0.08	
2002	0.04	0.10	0.09	0.12	0.15	0.13	0.12	0.10	0.10	0.09	
2003	0.13	0.10	0.13	0.14	0.19	0.15	0.13	0.10	0.11	0.12	
2004	0.29	0.17	0.30	0.23	0.31	0.29	0.35	0.21	0.20	0.25	
2005	0.45	0.21	0.67	0.22	0.35	0.54	0.33	0.22	0.17	0.18	
2006	0.40	0.20	0.60	0.23	0.27	0.43	0.05	0.20	0.19	0.17	
2007	0.38	0.18	0.42	0.23	0.35	0.41	0.45	0.21	0.20	0.18	
2008	0.52	0.21	0.46	0.25	0.28	0.44	0.25	0.21	0.20	0.18	
2009	0.40	0.22	0.44	0.27	0.34	0.41	0.25	0.25	0.25	0.21	

Table 1: Share of Least-Traded Goods

 Table 2: Share of Least-Traded Goods

Austrian Imports from											
Year	Cyprus	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Malta	Poland	Slovakia	Slovenia	
1999	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
2000	0.07	0.09	0.07	0.09	0.12	0.12	0.08	0.10	0.09	0.09	
2001	0.10	0.10	0.09	0.09	0.11	0.21	0.07	0.10	0.10	0.09	
2002	0.13	0.10	0.14	0.11	0.17	0.34	0.06	0.13	0.15	0.13	
2003	0.13	0.11	0.50	0.13	0.23	0.32	0.07	0.17	0.18	0.15	
2004	0.52	0.20	0.67	0.14	0.30	0.45	0.12	0.23	0.22	0.31	
2005	0.69	0.21	0.52	0.20	0.28	0.65	0.50	0.26	0.34	0.20	
2006	0.54	0.23	0.37	0.20	0.32	0.68	0.61	0.29	0.39	0.20	
2007	0.66	0.23	0.45	0.21	0.53	0.69	0.41	0.31	0.38	0.21	
2008	0.75	0.23	0.60	0.23	0.51	0.73	0.57	0.31	0.38	0.23	
2009	0.91	0.24	0.70	0.23	0.74	0.78	0.58	0.39	0.45	0.25	

is consistent with the pattern between Austria and its border countries, Hungary being the sole exception. Table 2 shows the sets of least-traded goods grow from 10% of Austrian imports in 1999 to 90.8% (Cyprus), 70.3% (Estonia), 74.4% (Latvia), 77.7% (Lithuania), 57.9% (Malta), and 39.5% (Poland) in 2009. The mean share of the least-traded goods in 2009 across these countries is 68.4%, which, again, exceeds the mean of 29.3% in 2009 across the border countries. The number of least-traded goods is also larger for Austrian imports from the remaining EU entrants than Austrian exports to these countries. The sets of least-traded goods for Austrian imports from Cyprus, Estonia, Latvia, Lithuania, and Malta contain more than 90% of the 4-

digit codes. There was not much of a trade flow from these countries to Austria at the beginning of the period I consider. It should be no surprise then that after a trade liberalization the new goods margin would change so dramatically. Indeed, tables 1 and 2 show the timing of EU enlargement coincides with significant increases in the shares of least-traded goods in the trade flows between Austria and the remaining EU entrants.

4 Conclusion

In addition to the new goods margin clearly playing a significant role in changing the trade flows between Austria and its border countries, the analysis of the trade flows between Austria and the remaining EU entrants provides even stronger evidence for the importance of the new goods margin. My time series measure indicates growth in the new goods margin coincides with the 2004 enlargement of the EU. In terms of the trade data, the hype surrounding the historic nature of the 2004 enlargement seems justified. These results suggest economists should strongly consider models with extensive margins when analyzing the effects of trade liberalizations. Also, policy-makers interested in the trade effects of future enlargement of the EU should consider the results presented in this paper. Any enlargement including, for example, countries comprising former Yugoslavia would potentially see the same types of patterns emerge as the ones identified here for the countries involved in the 2004 enlargement.

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