

Anatomy of Austria's trade in services

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This study analyzes Austrian exports of business services as an indicator of non-price competitiveness in manufacturing before and after world trade collapsed in 2008/09. A unique company dataset was used for this purpose and broken down into individual product/market combinations. The trend analysis differentiates between export growth along the intensive margin (intensifying existing export relations) and along the extensive margin (establishing new export relations). The extensive margin, which signifies export diversification, is more important for the development of manufacturers' service exports than that of the service sector. This applies in particular to manufacturers that are more technology intensive and it implies that Austrian manufacturers develop know-how to establish new foreign trade relations. After the global trade meltdown, however, manufacturers' service exports seemed to have primarily helped maintain long-term trade relations, with the extensive margin losing significance. This indicates a worsening of the framework conditions (heightened protectionism) and weak development of foreign trade in goods having a negative impact on service exports.

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Seven years after the collapse of global trade in 2008/09, Austria has lost its growth lead over Germany and the euro area average and is now showing weak development: annual economic growth has been below 1% since 2012, foreign trade is suffering from subdued export activity, and Austria has been losing ground as a business location in the eyes of international investors (Scheiblecker, 2015; WKÖ, 2015). Does this mean that Austria's international competitiveness is negatively affected? The European Commission rates the external stability of its member countries based on price competitiveness measured in terms of the current account balance, export market shares, real effective exchange rates, and unit labor costs (European Commission, 2016). Here, the Commission critically points to the development of Austrian export market shares, which may, however, differ depending on the definition and calculation method used.² Aiginger (2016), Scheiblecker (2015), Schiman (2016), and Ragacs and Vondra (2016)

do not see a deterioration of Austria's price competitiveness. Breuss (2015) and Scheiblecker (2015) rather cast doubt on how much more competitive Austria really was in the past considering demand boosts stemming from the fall of the Iron Curtain and EU expansion that benefitted Austria comparatively more than other EU Member States. This growth impetus faded for Austria as the EU did not see new enlargement rounds and geopolitical tension hampered growth in the Balkan and Black Sea region. Tichy (2015) looks at the issue of trading partner countries, considering possible structural weakness with a spin on product mix in foreign trade. He sees a focus on slow-growth target markets (the euro area as opposed to the rest of Europe and Asia) and product groups. Economic policy debate hence turns to the issue of non-price competitiveness and aspects like product quality, technological intensity, and trade structure. Drawing on current literature about smart specialization (European Commission,

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² Austria's share in global exports increased in 2013 and 2014, whereas it declined in terms of trading partners' imports (weighted with the Austrian export market shares). For more information on the various definitions and calculation methods, see Ragacs and Vondra (2016).

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2012; Stöllinger, 2015; Reinstaller, 2014) Tichy concludes that Austria's export woes are primarily due to a lack of diversification in the product/market portfolio.

When returning to the initial question of the economic policy discussion and in particular to the current account balance as the key indicator of external stability, it stands out that the service trade surplus has been the main support of Austria's current account balance in the past 15 years. Apart from tourism as a main pillar of the current account surplus, a wide range of business services, where Austria has over time acquired a comparative advantage, has also made a substantial contribution (Schiman, 2016). This study takes a close look at this – compared with goods exports – less analyzed aspect of the Austrian trade balance, focusing on export growth in business services in the years following the slump in global trade as compared to the time before. Picking up the discussion in Tichy (2015) and following the approach used by Stöllinger (2015), this study tries to shed light on the question whether service exports have grown by intensifying existing export relations (intensive margin) or by establishing new export relations (extensive margin) and if there is a difference to the ailing goods trade. After a presentation of the relevant data base and statistical approach (section 1), the study examines business service exports overall (section 2). This is followed by a breakdown of the data by industry to investigate the service component as one aspect of non-price competitiveness in the manufacturing sector, while considering the various technology levels by industry (section 3). Finally, the analysis is followed by a summary and conclu-

sions which might be relevant for economic policy discussion (section 4).

1 Data and methodology

Stöllinger (2015) analyzed growth in Austrian manufacturing firms' goods exports between 2010 and 2013, i.e. after the global trade crisis. He focused on the question whether Austria's goods exports expanded because existing trade relations were intensified (intensive margin) or rather because new ones were established (extensive margin). Stöllinger defines trade relations as specific combinations of products and importing countries as, for instance, bicycle exports to Italy. Stronger development at the intensive margin indicates greater specialization while strength at the extensive margin points to export diversification. To determine shifts in the importance of these two dimensions in goods exports, Stöllinger chose the years 2000 through 2003 as comparative base.³ His analysis is based on nominal goods export data at the detailed product level (HS 8 level) limited to manufactured goods exports. Together with the importing countries, this set of 8,645 export products results in a total of 290,240 export relationships. In line with the approach used in Haddad et al. (2010), the data were adjusted for price changes and export development was broken down into four components: (1) a quantitative effect for all continuously exported products and (2) a price effect of these products (intensive margin), (3) the contribution of new export relations and (4) the erosion of the export value by expiring trade relations (extensive margin). While changes at the intensive margin, especially related to the quantitative effect, point to a shift in foreign de-

³ Stöllinger might have chosen this reference period to avoid distortions from the trade boom in 2004 through 2007 in his analysis.

mand, changes at the extensive margin suggest supply-side factors considering the fixed costs of market entry (Haddad et al., 2010; Stöllinger, 2015). Such factors include stepped-up innovation efforts as well as limited access to export financing and an increase in protectionist measures.⁴

This study examines to what extent a similar approach may be applied to analyzing business service exports. Services as well as goods are both the outcome of production processes. However, while ownership rights in physical goods are readily tradable, services are nontradables, as they are the result of production activities that change the conditions of the consumers or facilitate the exchange of products or financial assets. The term business services is defined in line with the Extended Balance of Payments Services (EBOPS) classification and is used in this analysis for such services that are predominantly contracted by enterprises and reported by means of company surveys. Business services include transportation, insurance and banking, consulting, telecommunications, computer and information services, research and development, architectural and engineering services as well as patents and licensing. They also comprise construction services, whereas travel services that are mostly used by private consumers (mainly restaurants and hotels) as well as government services are excluded.

Business services are largely tied to goods trade, accompanying industrial goods throughout their life cycle, namely from product development to advertising and market research, consulting and training, transportation (including insurance), and engineering (e.g. installation and maintenance). Such services are not exclusively rendered by the service sector but also by manufacturers either indirectly by buying-in from the service sector or directly through insourcing. From a competitiveness perspective, this is a matter of non-price competitiveness as intellectual know-how is added to physical products to generate a quality advantage and market leadership. Higher service intensity allows manufacturers to distinguish themselves from their competitors, establish lasting business partnerships, and get higher prices for their exports (Nordas and Kim, 2013). Competition through product differentiation is increasingly moving away from the underlying products and into supplementary services (Wolfmayr, 2012).

Before the outbreak of the global financial, fiscal and economic crisis, goods trade and service trade developed very much in line with each other in Austria. Both datasets are based on balance of payments statistics and hence considered in calculating the current account balance.^{5,6} The more dynamic service trade would basically reflect the goods trade development. Yet, after the

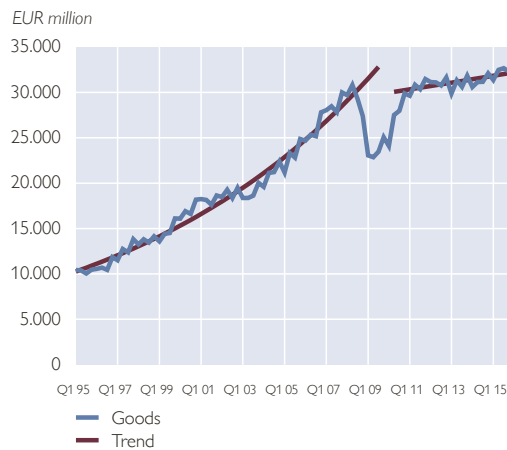
⁴ This touches on the hypothesis that world trade worsened in structural terms in the wake of the 2009 trade collapse, which may have lasting repercussions on the export activity of some countries. However, both the intensive and the extensive margin are subject to supply-side and demand-side factors. Their effective impacts would have to be econometrically tested to draw concrete conclusions. In their approach, Haddad et al. decompose export development, considering changes in both volume and price at the intensive margin.

⁵ In contrast to external trade statistics, the balance of payments uses a definition of goods trade whose qualifying criterion is change in ownership rather than mere border crossing. Goods trade under the balance of payments definition therefore also includes goods that do not cross the Austrian border but excludes insurance, transport, and goods exchanged for processing.

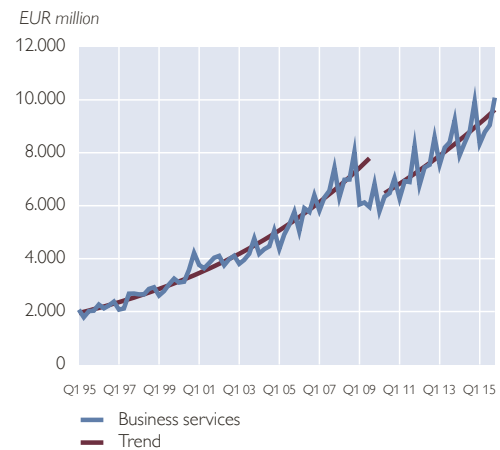
⁶ Balance of payments statistics cover – in addition to travel – two other kinds of services, namely (1) cross-border services, e.g. the electronic exchange of legal and financial services, and (2) services rendered by a natural person on site (involving that person's temporary physical presence), e.g. to install or repair goods. Services rendered through commercial presence are not part of the balance of payments.

Growth in goods and services exports – trend

Goods



Business services



Source: OeNB, Statistics Austria.

2009 trade collapse, their paths split. Service trade did not drop as drastically as goods trade and the subsequent recovery was also more moderate. The two trade tracks decoupled further in the years that followed, with goods trade stagnating and service trade continuing to thrive. As such, service trade has cushioned the effects of slow goods trade and thus helped to stabilize Austria's external economy (in terms of the current account balance).

In this study, service trade from 2010 through 2012 is compared with the period from 2006 through 2008. These two periods were chosen for the following reasons: First, statistics on cross-border service trade capturing detailed exports and imports based on company surveys only date back to 2006 and are therefore fairly new compared with external trade statistics; second, following a change in international methodology (introduction of the sixth edition of the IMF's Balance of Payments and International Investment Position Manual – BPM6), comparable corporate data necessary for separating the trends at the intensive and the

extensive margin are only available up to the year 2012. Throughout the entire observation period from 2006 through 2012, technical services were the key growth factor for business service exports in Austria, running a close second to transportation as the leading service export (each accounting for around one-third of total export revenue). Technical services include telecommunications, computer, and information services, research and development, engineering and architectural services, and fees for the use of intellectual property (patents and copyrights). While Austria traditionally does not generate much revenue from the use of intellectual property, exports of architectural and engineering services as well as computer and information services have been booming. Research and development contracting has lost some momentum in the wake of the global financial, fiscal and economic crisis. Compared with technical services, business services like legal, tax, and corporate consulting as well as advertising and market research display only limited long-term growth potential.

Insurance and financial services contracted markedly during the financial, fiscal and economic crisis.

Although business service exports have grown vigorously in the past 20 years, well surpassing tourism as a revenue source (two-thirds of service revenue now stem from business service exports), their tradability, and thus growth potential, remains limited. This is a result of linguistic and cultural barriers as well as nontariff trade restrictions like organizational regulations or the need to obtain professional licenses (Nordas, 2016). The gap to goods exports as measured by Austria's export ratio has thus not narrowed in the long run but actually widened.⁷ Limitations to service tradability are also reflected by Austria increasingly focusing its exports on its neighbors and EU Member States. In 2012, neighbor countries accounted for approximately 60% of total exports and EU members for some 72%. In other words, regional concentration has increased over time.

Table 1

Key target countries for business services exports

Rank	Country	2006–2012		
		EUR million	Share in %	Change in percentage points
1	Germany	11,099	36.57	3.58
2	Switzerland	2,378	7.84	-2.44
3	Italy	1,730	5.70	-0.71
4	United Kingdom	1,025	3.38	-0.71
5	U.S.A.	920	3.03	-1.28
6	Netherlands	815	2.68	0.18
7	France	773	2.55	0.16
8	Hungary	769	2.53	-0.06
9	Czech Republic	744	2.45	0.06
10	Russian Federation	724	2.39	1.09
15	Turkey	401	1.32	0.71
19	China	305	1.01	0.06
	Total	30,347	x	x

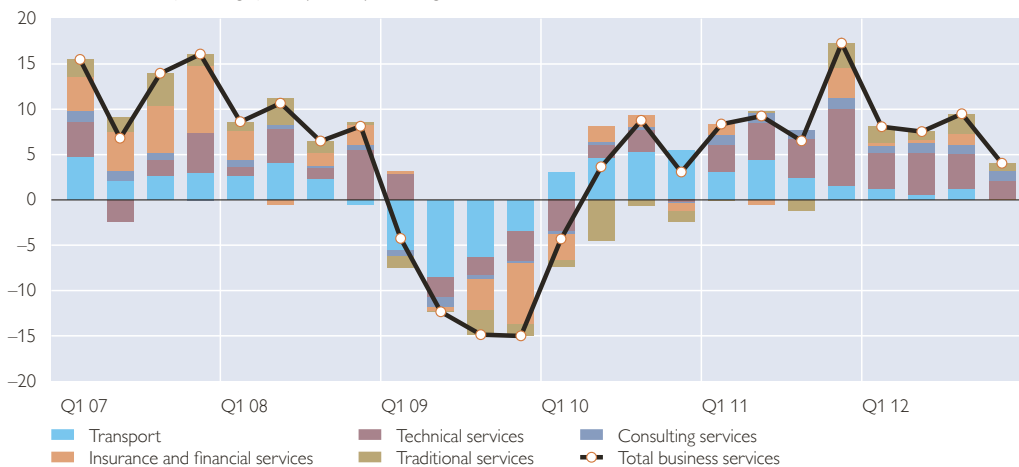
Source: OeNB, Statistics Austria.

There are only two countries among Austria's main export destinations that

Chart 2

Growth in business services exports

Growth contributions in percentage points, year-on-year change in %



Source: OeNB, Statistics Austria.

Note: Up to 2012: final data, 2013 and 2014: revised data, 2015: preliminary data.

⁷ The gap between the exports-to-GDP ratios of goods and services came to 29.7 percentage points in 2012.

are not EU or neighbor countries, namely the U.S.A. and Russia. The by far most substantial growth contribution in the period under review came from Germany, Austria's most important trade partner. In the period from 2006 through 2012, EU Member States dominated Austria's service export growth at an annual average of +5% over non-EU Member States (+3.8%). Advances in potential growth markets during this period were chiefly ascribable to Turkey and, to a lesser extent, China.

Using the method developed by Haddad et al. (2010) for differentiating export growth along the intensive and the extensive margin should reveal whether growth in business service exports is due to continuous specialization or greater diversification, i.e. changes in service types or export markets. To be able to distinguish the intensive from the extensive margin, this study did not draw on external trade statistics (balance of payments) but looked directly at the underlying corporate statistics. The latter, which have been available since 2006, comprise nominal business service exports reported by some 5,000 companies on a quarterly basis. The balance of payments statistics, in addition, capture macroaggregate projections that mask the development of the underlying export relations. In this study, the data are analyzed at the most granular level according to the service classification of the IMF's fifth balance of payments manual (EBOPS, 2002). From the existing company data set export relations were compiled by combining reported services (53 types)

and markets (351 individual countries as listed by ISO code).⁸ Compared with external trade statistics, data granularity is low. Of 18,603 possible combinations, evidence was found for 8,830 export relations. It is hardly surprising that the main partner country was Germany and the dominant service was transportation.

In 2014, Austria started publishing its balance of payments on a presentational basis in line with the BPM6 and EBOPS 2010 as well as ESA 2010 standards. From the reporting year 2013 onward, corporate data hence correspond to the new conventions. The new standards introduced a greater number of possible service types and shifts between the individual service categories, particularly by classifying services between affiliated companies under basic service items. This study therefore focuses on the period between 2006 and 2012 because these datasets are comparable.⁹ The time period before the global trade meltdown (2006–2008), the crisis peak (2008–2009), the recovery period (2009–2010), and the subsequent phase of robust growth in trade relations (2010–2012) are compared. As Stöllinger (2015) remarks, results of margin studies not only depend on the level of detail in the input data but also on the review period. The longer the review period, the more important the development along the extensive margin becomes as export relations in their early stages tend to be of low value and contribute only little to export growth.

While foreign trade statistics reflect a near-complete dataset based on the

⁸ For the purposes of this study transit trade was eliminated from the services covered because, from an analytical perspective, such trade is closely related to goods trade. Furthermore, the gross insurance premium volume was used to calculate the respective service component in line with the European System of National Accounts (ESA 1995).

⁹ Services between affiliated companies refer to general group administration services not rendered to third parties. Under the revised rules of balance of payments statistics, these services may no longer be compiled as an aggregate; instead, they must be allocated to individual types of service.

sales tax system for intra-EU trade and the customs administration system for extra-EU trade, the dataset on cross-border trade in services is derived from a concentration sample. The basic statistics to cover the total business population from which the sample is drawn is the Structural Business Statistics. Companies must report both transaction directions – exports and imports – even if there is only one incident above the current threshold value. The purpose of this sampling is to get high data coverage from a small set of respondents, which results in a narrow corporate concentration, as some 10% of the companies in the dataset generate 80% of the export revenue covered. In terms of the product/market combinations, this implies that less than 50% of trade relations account for 50% of total exports. Moreover, there is hardly any evidence of additions or deletions to the trade relations. Besides the compilation practice, this is traceable to the fact that the data are by far not as granular as foreign trade statistics. To differentiate between the intensive and the extensive margin as well as between continuing and new export relations, a threshold value is defined in this study beyond which a relationship shall be deemed stable and continuing. Subliminal product/market combinations below this threshold may reflect statistical fluctuations, but also emerging export relationships, which, while contributing only minimally to total exports at the time of data collection, may grow into continuing export relations in the future. In line with the structure of the underlying concentration sample, the threshold value was set so that in each of the years under review at least 90% of the exports are above it. In terms of overall service transactions, this corresponds to an export value of some

EUR 7 million or an average of 370 product/market combinations.

Looking at data from individual companies would have been another option to distinguish export development into continuing and new product/market combinations. Expanding the approach of Haddad et al. (2010) to a combination of company/product/import country would imply greater volatility in the development used to separate the intensive from the extensive margin. This approach would, however, shift the focus to a company's market entry or exit. In contrast to studies investigating the global trade collapse, analyzing companies' or company/product combinations' market entries or exits is not the objective of this study. Returning to the initial example, the entry of company x into the Italian bicycle market would establish a new export relation even though company y already has the same export business. While for company x this is a diversification of its export activities, for the Austrian economy as a whole, this is a further specialization. Furthermore, a company being a newcomer to the statistics is not necessarily synonymous with it being new to the export market. Up to 2012, the reporting base for Austrian cross-border service transactions was updated in periodic analyses of the entire underlying base by means of structural business statistics. Only from 2013 onward, i.e. under the new methodology, did the reporting base become subject to regular reviews based on sales tax data.

In analogy to Stöllinger (2015) and Haddad et al. (2010), service exports are decomposed according to the following methodology:

Export value v at time t :

$$v_t$$

The nominal export value of individual services v_t^i (with I being the total number of service types) is expressed as the product of the specified scope of service q and export price p :

$$v_t^i = p_t^i * q_t^i$$

The change in aggregate nominal exports between two points in time is expressed as follows:

$$\Delta v_t = v_t - v_{t-1} = \sum_{i=1}^I p_t^i * q_t^i - \sum_{i=1}^I p_{t-1}^i * q_{t-1}^i$$

The number of export relations at time t may be broken down into: (1) continuing export relations above the threshold value that already existed at time $t-1$ and continue to exist at time t ; (2) new export relations that are above the threshold value at time t but were below the threshold value at time $t-1$; (3) expiring export relations that have fallen below the threshold value at time t while having still been above it at time $t-1$; (4) subliminal export relations that are below the threshold value at both time t and $t-1$. Continuing export relations are indexed c (for continuous), new export relations are indexed n (for entry), expired export relations are indexed x (for exit) and subliminal export relations are indexed s (for subliminal).

Changes in aggregate exports are thus expressed as follows:

$$\begin{aligned} \Delta v_t = & \sum_{i=1}^C p_t^c * q_t^c - \sum_{i=1}^C p_{t-1}^c * q_{t-1}^c + \\ & \sum_{i=1}^N p_t^n * q_t^n - \sum_{i=1}^N p_{t-1}^n * q_{t-1}^n + \sum_{i=1}^X p_t^x * q_t^x - \\ & \sum_{i=1}^X p_{t-1}^x * q_{t-1}^x + \sum_{i=1}^S p_t^s * q_t^s - \sum_{i=1}^S p_{t-1}^s * q_{t-1}^s \end{aligned}$$

This term breaks down the change in aggregate exports into four components (from left to right): (1) export value change in existing export relations above the threshold value; (2) change due to establishing new export relations above the threshold value; (3) change due to expiry of export relations or their drop below the threshold value; and (4) change in export relations below the threshold value. The first component is called the intensive margin. Components two and three together form the extensive margin. The fourth component represents statistical noise, the residual of subliminal export relations. These may be incidental fluctuations in the survey resulting from the structure of the data collection (reporting both export and import transactions). However, over a longer time horizon, such subliminal relations may lead to new export relations that would then be allocated to the extensive margin and raise its impact.

Following the Haddad et al. (2010) approach, Stöllinger (2015) decomposes the intensive margin into a quantity and a price effect. Under this approach, implicit export prices are determined by dividing the export values by the respective export volume. This way it is possible to ascertain whether intensive margin development stems from volume and/or price changes. This differentiation furthermore allows making inferences about the effects of supply-side and demand-side factors.¹⁰ As there is no separate information on the specified scope of service provision, nominal export values are the only data available for analysis. As such, apparent developments along the intensive margin do not unambiguously indicate demand effects in service exports. Development

¹⁰ It stands to reason that demand factors will translate into parallel volume and price changes. Supply factors would have the opposite effect and, in case of a negative shock, would lead to a declining export volume at a simultaneous rise or at least slower erosion of export prices (Haddad et al., 2010).

at the extensive margin suggests that the establishment of new or expiry of existing export relations are the result of both supply and demand side factors.

2 Business services are growing along the intensive margin

Stöllinger (2015) concludes in his study of manufacturing firms' goods exports in the period between 2010 and 2013 that these primarily grew at the intensive margin. The increase in the value of existing export relations contributed 8.2 percentage points to total growth of 11.4%. The contribution of the extensive margin as net effect from newly established and expired export relations only amounted to 2.2 percentage points. For lack of reliable data, the remaining export development cannot be explained. Intensifying existing export relations was thus the dominant driver of growth for manufactured goods exports. Also the export decline in the 2009 trade collapse was due to intensive margin effects. Moreover, a comparison with the period from 2000 to 2003 shows that the intensive margin was the main driver of export growth even more so before, than after, the outbreak of the financial, economic and fiscal crisis. Stöllinger (2015) thus came to the conclusion that the intensive margin accounted for over 70% of the growth in manufactured goods exports after the world trade plunge. As the quantity effect was the main trend driver at the intensive margin, this suggests that the slowdown in export development relative to the pre-crisis period resulted from diminishing foreign demand.

Applied to nominal service exports, the method of decomposing growth into the intensive and the extensive margin as described in section 1 indicates that in the four review periods service trade also primarily developed at the intensive margin. In contrast to goods exports,

intensive margin dominance strengthened in service exports once the trade collapse had been overcome:

In the time from 2010 to 2012, service exports grew about as strongly as before the crisis (+17%). Continuing trade relations accounted for 15.8 percentage points or 93% of total export growth. The extensive margin became irrelevant. Subliminal development accounted for 1.3 percentage points or some 7% of export value growth. In the period before the global trade collapse, continuing product/market relations contributed 15.7 percentage points to total value advances of 18.3%. The extensive margin contribution, i.e. the net effect of new and expiring export relations, came to 0.7 percentage points. This means that in the period from 2006 to 2008, the intensive margin dominated export growth at 86%, while the extensive margin contributed merely some 4%. The extensive margin and subliminal development together yielded a combined growth contribution of 2.5 percentage points or approximately 14% of total export growth. During the 2009 global trade meltdown, Austrian service exports mostly slumped at the intensive margin. Continuing trade relations accounted for 10 percentage points of the 12% drop in export reve-

Table 2

Growth in business services exports along the intensive and the extensive margin

Export growth contribution

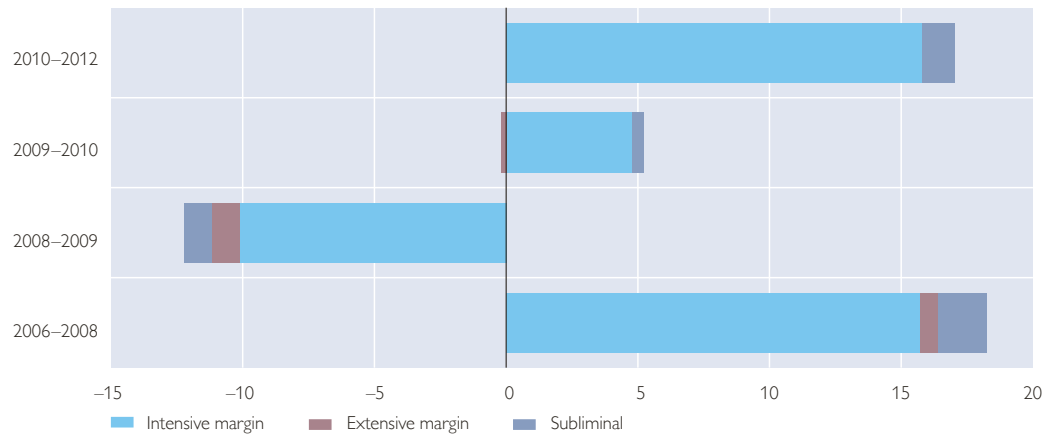
	2006– 2008	2008– 2009	2009– 2010	2010– 2012	2006– 2008	2008– 2009	2009– 2010	2010– 2012
	Percentage points				%			
Intensive margin	15.72	-10.14	4.79	15.79	86.2	83.0	95.4	9.3
Extensive margin	0.70	-1.03	-2.00	0.01	3.8	8.4	-3.9	0.1
New export relations	2.62	1.35	2.04	1.80	14.4	-11.0	40.7	10.6
Expired export relations	-1.92	-2.38	-2.24	-1.79	-10.5	19.5	-44.6	-10.5
Subliminal development	1.83	-1.05	0.43	1.25	10.0	8.6	8.5	7.3
Total	18.25	-12.21	5.02	17.05	100.0	100.0	100.0	100.0

Source: OeNB.

Chart 3

Growth in business services exports along the intensive and the extensive margin

Growth contributions in percentage points



Source: OeNB.

nue, while new export relations and subliminal development contributed about 1 percentage point each to the loss. Setting total export growth at 100%, continuing export relations made up 83% of the decline, the extensive margin 8% and subliminal relations 9%. The extensive margin remained in negative territory during the 2010 recovery so that the intensive margin carried 95% or almost all of the 5 percentage point increase.

3 Industry-specific results

Differentiating service trade development into existing and new export relations

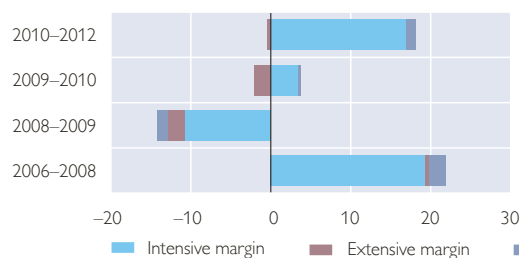
shows that the intensive margin played a dominant role in service exports both before and after the crisis. Hence, business services generated growing revenue mainly due to increased specialization, which, absent sufficient price information, may be chiefly explained by positive demand development in existing export relations. Compared with before the global trade collapse, the relative contribution of the extensive margin has been declining further. As the next step, the analytical approach laid out in section 1 is applied to the manufacturing sectors that render services abroad. Here, a distinction is made be-

Chart 4

Growth in business services exports along the intensive and the extensive margin

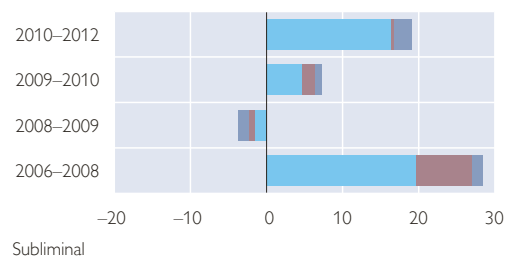
Service sectors

Growth contributions in percentage points



Manufacturing

Growth contributions in percentage points



Source: OeNB.

tween regular service sectors and the different economic sectors that also offer services. As in the Stöllinger (2015) study, the focus is on the manufacturing sector as listed in section C of ÖNACE 2008. Other producing units covered in sections A and B, agriculture and mining, D and E, public utilities, and F, construction, are treated as service providers as they offer distinct types of services that are classified in the underlying EBOPS methodology. In manufacturing, services (measured as part of resource use and total sales) can enhance international competitiveness by raising their productivity and facilitating access to foreign markets (Lodefalk, 2012). Hence, there is a positive correlation between services and manufacturers' exports. Studies show that service intensity in manufacturing is on the rise as are service exports of industrial companies (Kelle, 2012; Lodefalk, 2012; Wolfmayr, 2012). Based on company-level data reported in Austria, service exports by manufacturers grew twice as fast in the period under review (averaging about +7.9% per annum) as those of the service sector. Manufacturers' share in total service exports correspondingly advanced to 18%. However, the manufacturing service volume is still low compared with that of the tertiary sector (dominated by shipping, travel agencies, management activities of holding companies, corporate consulting, merchant agencies and wholesaling, road transport, and data processing). To better differentiate the development of manufacturers' service exports into the intensive and the extensive margin, the threshold value had to be adjusted.

The analysis shows that the intensive margin carries export revenue development in the service sector, which is the largest contributor to total export growth. Even in the manufacturing

sector, intensifying product/market relations are the key drivers of export development. In contrast to the service sector it stands out, though, that between 2006 and 2008, the contribution of the extensive margin was more pronounced in manufacturing. While continuing export relations contributed 19.7 percentage points to total growth of 28.4%, new export relations added 7.3 percentage points. In other words, the intensive margin contributed 69.5% to export growth and the extensive margin accounted for 25.8%. The extensive margin and subliminal development together made up about one-third of export growth before the trade collapse. At 21.9%, growth of service sector exports was overall lower than that of manufacturers between 2006 and 2008. Moreover, the intensive margin dominated advances in service sector exports at 19.3 percentage points or some 88% of the total. The extensive margin only contributed 0.6 percentage points or 2.6% of export growth and 11.8% when combined with subliminal effects.

Comparing the service and manufacturing sectors also illustrates that the 2009 drop in Austrian service exports was much more moderate at the manufacturing end. Manufacturers suffered virtually no losses to their existing service relationships. This indicates that foreign demand may have fallen only slightly. Moreover, manufacturers' business services exports grew more strongly in the 2010 recovery than that of service providers. This was not merely thanks to reviving export activity in existing trade relations but also to resurgence at the extensive margin that contributed 1.8 percentage points or some 25% to total export growth. In the subsequent period between 2010 and 2012, however, the extensive margin lost its significance for manufactur-

ing. After the global trade slump, new export relations only contributed 1.6% to total export advances, less than the share of subliminal development. This shows that manufacturers' growth lead prior to 2009 was due to establishing new service business. When this momentum waned after 2010, manufacturers' service exports developed in line with the service sector. Extensive margin effects in the service sector even were on the negative side after the trade crisis. A closer look at the dynamics in new export relations should provide some interesting insights:

The manufacturing sector established new service export relations totaling EUR 279 million in 2008, whose growth contribution, compared with 2006, amounted to 8 percentage points. They hence accounted for 28% of total export growth. At the same time, expiring product/market combinations totaled EUR 30 million, yielding the above-mentioned net effect of 7.3 percentage points. In 2012, the value of new export relations was only slightly lower at EUR 250 million. Compared with 2010, this corresponds to a 5.4 percentage point contribution to growth and again a share of some 28% in total export growth. This shows that the impact of new export relations before and after the global trade collapse is comparable. However, between 2010 and 2012, their positive contribution to growth was offset by the negative impact of expiring export relations.

As was already found to be true for the total population of service exporters,

service sector growth is specifically driven by the intensive margin and therefore by rising demand in existing export relations. By contrast, export development in the manufacturing sector indicates that the extensive margin had some impact there as well, which resulted in appreciable positive growth effects both in the time before the trade meltdown and in the recovery period immediately thereafter. In a next step, manufacturers' business service exports are broken down further to analyze the contributions of the intensive and the extensive margin by technology intensity. Products with higher technology intensity are based on complex production processes, where business services like research and development as well as engineering services play important roles (Nordas and Kim, 2013). It is therefore interesting to examine to what extent high-technology industries in manufacturing export business services and if such exports tend to grow along the intensive or the extensive margin. In this study, the OECD methodology is used to differentiate the respective technology levels. The OECD distinguishes between four levels of technology intensity depending on the manufacturing industry and end use of goods (OECD, 2010). The focus is on R&D intensity both directly as a ratio of R&D expense to production costs and indirectly as the R&D share in acquired intermediary and capital goods.^{11,12}

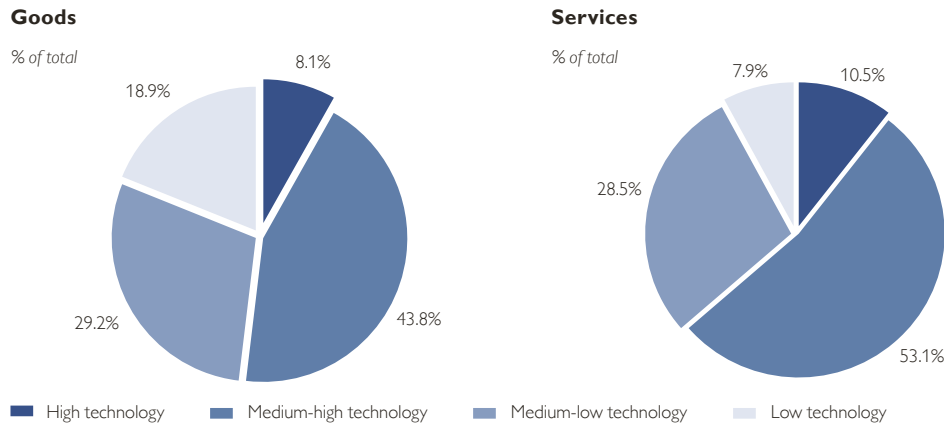
- High-technology industries: pharmaceuticals; office, accounting and computing machinery; radio, TV

¹¹ For the detailed presentation of manufacturers' service exports, the data were adjusted both for the entry of a major corporation into the survey population and for the industry reassignments under ÖNACE 2008. Furthermore, threshold values were set separately for each technology level to achieve 90% transaction coverage for each segment. For this reason, the total of the individual technology segments does not equal total manufacturing values.

¹² The service sector may also be broken down further, e.g. into network industries like transportation and other services, to better distinguish developments at the intensive and the extensive margin. While this could be examined in a follow-up study, this study focuses on manufacturers' service exports as a means of non-price competitiveness.

Chart 5

Manufacturers' exports by level of technology intensity



Source: OeNB, Statistics Austria.

and communications equipment; medical, precision and optical instruments; aircraft and spacecraft

- Medium-high-technology industries: Electrical machinery and apparatus, n.e.c.; motor vehicles, trailers and semi-trailers; chemicals excluding pharmaceuticals; machinery and equipment, n.e.c., railroad equipment and transport equipment, n.e.c.
- Medium-low-technology industries: Coke, refined petroleum products and nuclear fuel; rubber and plastics products; glass, other non-metallic mineral products; building and repairing of ships and boats; basic metals and fabricated metal products
- Low technology industries: manufacturing, n.e.c.; recycling; wood, pulp, paper, paper products, printing and publishing; food products, beverages and tobacco; textiles, textile products, leather and footwear

Data from the company sample show that high-tech companies are Austria's main exporters of goods and services. This is even more pronounced in services

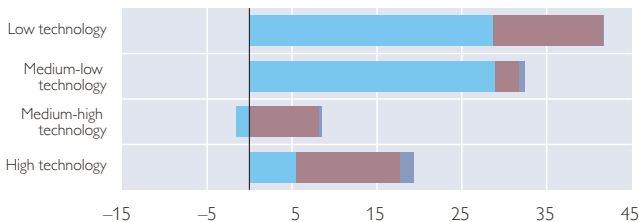
than in goods. Comparing goods and service exports also clearly shows that high-technology industries are relatively more important for trade in services, while low-technology industries only play a minor role. Relative to their weight in the survey population, high-tech and medium-high-tech industries make disproportionately strong contributions to service exports. Service intensity as measured by the share of service exports in goods exports also reflects the leading role of the top two technology industries. For manufacturing overall, this ratio stands at some 8%.¹³ In the high-technology segment, the ratio is about 10% and in the medium-high-technology segment 9%. The medium-low-technology segment has a service intensity ratio of 7% and the low-technology segment comes in at 3%. A look at service export dynamics over the entire period under review reveals, however, that the low-tech segment showed the strongest growth at an annual average of some 11%. These findings corroborate the results

¹³ The value of service intensity seems low and may indeed be underestimated. This is, on the one hand, due to the fact that the EBOPS 2002 and ESA 1995 methodology classifies processing under goods rather than services and, on the other hand, that service value added to goods in the destination country by commercial presence of the vendor does not enter the balance of payments statistics.

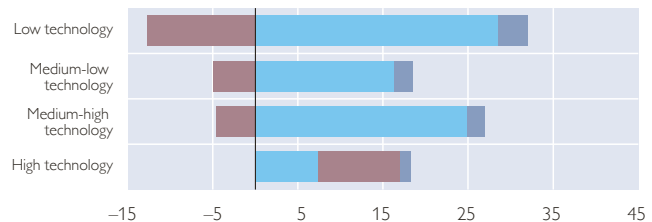
Growth in business service exports along the intensive and extensive margin by industry

Growth contributions in percentage points

2006 to 2008

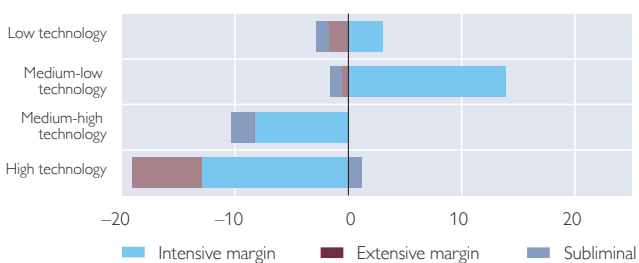


2010 to 2012

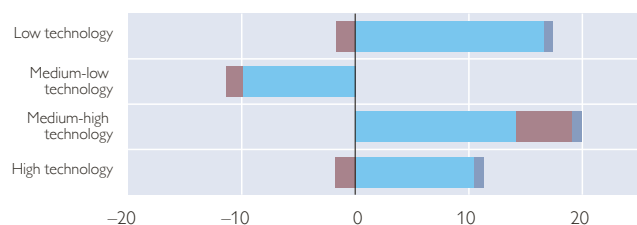


Growth contributions in percentage points

2008 to 2009



2009 to 2010



■ Intensive margin ■ Extensive margin ■ Subliminal

Source: OeNB.

presented in international studies of the use of services in manufacturing. According to these studies, service intensity is most pronounced in higher-technology industries, but the lower-technology tiers show stronger service growth on account of catch-up effects (Nordas and Kim, 2013). Researchers especially highlight the surprising development at the low-technology end. The increasing share of services (transport, communications) seems to help these segments (e.g. the textile industry) not only lower costs but also boost their international competitiveness.¹⁴

In the time prior to the trade plunge, service exports by high-tech industries rose markedly, namely by almost 20% between 2006 and 2008. The extensive margin was the main

driver in this period, which together with subliminal effects made a joint contribution to growth of 14 percentage points. This accounted for some 72% of total growth. Growth in business services in the medium-high-technology segment was somewhat less dynamic but was entirely the result of establishing new service relationships. Pre-crisis business services in the medium-low and low-tech segments mostly grew along the intensive margin, i.e. by specializing in existing trade relations. It is remarkable that, at about 42%, the low-technology segment posts the highest relative growth, with the establishment of new export relations (including subliminal effects) contributing 13 percentage points to growth, which equals a share of one-third. While the medium-low-technology segment ad-

¹⁴ Wolfmayr (2012) finds, based on an analysis of input/output data from manufacturers in the EU-15, that the service component in production rises with the technology, know-how, and marketing intensity of the industry.

vanced vigorously, too, new export relations added only little to growth. It follows that the extensive margin played a key role in service export growth in most manufacturing industries (especially in the higher-technology segments) before the trade collapse.

In the post-recovery period from 2010 through 2012, all technology sectors showed significant service export growth. In contrast to the pre-crisis period, however, the intensive margin took on the main role in export gains. That would suggest that a positive demand trend was the dominant factor in existing product/market relations. With the exception of the high-tech segment, where new business relations continued to boost export revenues by more than half, the contribution of the extensive margin turned negative in the other technology segments. The breakdown by technology intensity thus illustrates that a more prominent role of the intensive margin in service export growth after the trade collapse is typical of most technology segments. Only high-tech companies continued to see appreciable total growth contributions at the extensive margin. Although new trade relations still carried part of the immediate recovery in the medium-high-technology segment, this effect vanished in subsequent years. Another striking fact is that business services in the low-technology segment remained positive over the entire review period, even during the 2009 world trade plunge. The medium-low-technology segments developed countercyclically, with service export revenues starting to decline only in 2010. For the crisis year 2009, it stands out that the extensive margin with expiring service export relations was markedly negative only in the high-tech segment, on which the trade collapse had by far the strongest impact.

4 Conclusions, summary and outlook

Austrian exports of business services continued to expand at a robust pace in the years after the global trade crisis and helped cushion the weakness in goods trade. Differentiating export development along the intensive (intensifying existing export relations) and the extensive (establishing new export relations) margin helps determine whether service export dynamics are due to greater specialization or diversification in trade relations. In analogy to the Stöllinger (2015) approach, company-level data on service exports were broken down into individual product/market components. Compared with foreign trade statistics, this dataset is subject to some limitations. These include lower data granularity with regard to the types of services, a shorter observation horizon (2006 through 2012), and the availability of only nominal-value data. The dataset also yields more concentrated results owing to the structure of data collection. To distinguish between continuing and new or expiring export relations, a threshold value is used in this study. As the analysis shows, this makes it possible to demonstrate differences in the development before and after the world trade collapse and between the manufacturing and the service sector. Broken down by the technology intensity of industries, the results serve to assess non-price competitiveness in manufacturing, both in terms of service intensity and in relation to existing and new export markets.

In the period following the global trade collapse, i.e. between 2010 and 2012, over 90% of service export growth stemmed from gains at the intensive margin. Compared with the period prior to the trade tailspin (2006–2008), the extensive margin

lost nearly all its significance. As in goods trade, growth mainly derived from intensifying existing trade relations. In contrast to goods exports, though, the intensive margin gained in importance against the pre-crisis period. In line with Stöllinger (2015), the conclusion is therefore that service trade tends to become increasingly specialized and export diversification is diminishing notably.

Breaking service exports down by exporting sector shows that the prominence of the intensive margin is driven by the dominant service industries. Manufacturing firms' business services exports appear more differentiated: Over the entire review period from 2006 through 2012, manufacturers' service exports grew about twice as fast as those of traditional service providers. In the period from 2006 through 2008, the extensive margin (combined with subliminal effects) contributed about one-third of export growth (about 12% in the service sector). In the high-tech and medium-high-technology segments, the extensive margin even dominated export growth. In line with Haddad et al. (2010), this might indicate supply-side effects, such as stepped-up innovation efforts in the manufacturing sector. Developing new services may enhance competitiveness especially in the higher-technology segments and appeal to new target markets.

In the period after the trade meltdown (2010–2012), the extensive margin lost its significance in the manufacturing sector, too, and the intensive margin became the dominant growth driver. This suggests that, amid subdued goods exports, services may have helped maintain long-term trade relations. Service export growth along the extensive margin remained notable only in the high-technology segment, where new trade relations accounted for over

half of the growth in exports. That service export diversification lost its role as main driver of growth also in the manufacturing sector may suggest a worsening of the framework conditions. Protectionist measures adopted by governments had increased during the global trade crisis, seemed to have slowed down in the subsequent recovery, but resurged as business momentum faltered again (Evenett, 2014). And trade in services is subject to a whole host of restrictions compared with goods trade (OECD, 2014). The trend is moving away from tariffs and other customs restrictions toward greater market regulation. This is further complicated by the fact that market entry restrictions do not merely depend on individual countries' degrees of protectionism but also on what form these take and how these restrictions differ between countries (Nordas, 2016).

A detailed analysis of the extensive margin shows, however, that the entire manufacturing sector added new export relations even after the trade crisis. Their positive growth effect was, however, offset by expiring product/market combinations. In his analysis of goods exports, Stöllinger (2015) likewise discusses the effects of expired export relations. Entering new markets may be interpreted as a discovery process in the pursuit of which exports only reveal their profitability potential (Hausmann and Rodrik, 2003). With regard to manufacturers' service exports, this means that their initial service offers would not result in long-term contracts or goods exports. Expiring export relations may thus also be taken as an indication that weak demand for exported goods has spilled over into services. Yet, slow economic growth is not the sole explanation for the world trade woes, long-term structural factors weigh in, too. Some international re-

search cites a partial reversal of the 1990s globalization trend and international distribution of labor (Constantinescu et al., 2015). Stöllinger (2015) does not yet see evidence of such factors in Austria's foreign trade. In light of the persistent global economic weakness, the IMF (2016) is calling for greater economic openness. Reversing the recent surge in protectionist measures could lend new impetus to international trade.

An analysis of the development of manufacturers' service exports, based on the time series of 2013 and 2014 currently available, shows that the

changes in demand-side and supply-side conditions first impacted export growth along the extensive margin and then spilled over to the intensive margin. In other words, export growth showed structural changes before slowing down, as existing export relations expanded at a reduced pace. Service intensity measured as the share of service exports in goods exports did not change, though. The high-technology segment remained on its own track, with service exports having grown only along the extensive margin in 2013 and 2014.

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Anhang

Table A1

Growth in business services exports along the intensive and the extensive margin: 2006 to 2008

	Total export growth		Service sectors		Manufacturing		High technology		Medium-high technology		Medium-low technology		Low technology	
	ppt	%	ppt	%	ppt	%	ppt	%	ppt	%	ppt	%	ppt	%
	Total export growth	15.72	86.2	19.31	88.2	19.72	69.5	5.48	28.3	-1.56	-22.5	28.87	88.9	28.75
Intensive margin	0.70	3.8	0.56	2.6	7.32	25.8	12.26	63.3	8.21	118.3	2.91	9.0	12.84	30.8
Extensive margin	2.62	14.4	3.05	13.9	7.98	28.1	13.75	71.0	11.46	165.3	3.60	11.1	16.41	39.4
New export relations	-1.92	-10.5	-2.49	-11.4	-0.66	-2.3	-1.49	-7.7	-3.25	-47.0	-0.69	-2.1	-3.57	-8.6
Expired export relations	1.83	10.0	2.03	9.3	1.35	4.8	1.64	8.5	0.29	4.2	0.69	2.1	0.08	0.2
Subliminal development	18.25	100.0	21.90	100.0	28.38	100.0	19.37	100.0	6.93	100.0	32.47	100.0	41.68	100.0
Total														

Source: OeNB.

Note: ppt = percentage points.

Table A2

Growth in business services exports along the intensive and the extensive margin: 2008 to 2009

	Total export growth		Service sectors		Manufacturing		High technology		Medium-high technology		Medium-low technology		Low technology	
	ppt	%	ppt	%	ppt	%	ppt	%	ppt	%	ppt	%	ppt	%
	Total export growth	-10.14	83.0	-10.78	75.8	-1.54	42.2	-12.93	72.2	-8.27	80.1	13.88	113.0	3.10
Intensive margin	-1.03	8.4	-2.13	15.0	-0.81	22.0	-6.16	34.4	-0.05	0.5	-0.54	-4.4	-1.70	-658.4
Extensive margin	1.35	-11.0	1.29	-9.1	3.17	-86.7	2.79	-15.5	4.58	-44.4	2.75	22.4	2.42	936.5
New export relations	-2.38	19.5	-3.43	24.1	-3.98	108.7	-8.95	49.9	-4.63	44.9	-3.29	-26.8	-4.12	-1,594.9
Expired export relations	-1.05	8.6	-1.30	9.2	-1.31	35.8	1.18	-6.6	-2.01	19.5	-1.06	-8.6	-1.14	-440.2
Subliminal development	-12.21	100.0	-14.21	100.0	-3.66	100.0	-17.92	100.0	-10.32	100.0	12.29	100.0	0.26	100.0
Total														

Source: OeNB.

Note: ppt = percentage points.

Table A3

Growth in business services exports along the intensive and the extensive margin: 2009 to 2010

	Total export growth		Total export growth				Manufacturing							
			Service sectors		Manufacturing		High technology		Medium-high technology		Medium-low technology		Low technology	
	ppt	%	ppt	%	ppt	%	ppt	%	ppt	%	ppt	%	ppt	%
Intensive margin	4.79	95.4	3.45	200.9	4.66	64.3	10.46	109.6	14.15	70.8	-9.90	87.2	16.66	105.8
Extensive margin	-0.20	-3.9	-2.06	-119.7	1.80	24.8	-1.78	-18.7	4.96	24.9	-1.47	12.9	-1.64	-10.4
New export relations	2.04	40.7	2.02	117.3	3.96	54.6	1.03	10.8	7.46	37.4	2.49	-22.0	3.86	24.5
Expired export relations	-2.24	-44.6	-4.07	-237.0	-2.16	-29.8	-2.81	-29.5	-2.50	-12.5	-3.96	34.9	-5.50	-34.9
Subliminal development	0.43	8.5	0.32	18.8	0.79	10.9	0.86	9.1	0.87	4.3	0.01	-0.1	0.73	4.6
Total	5.02	100.0	1.72	100.0	7.25	100.0	9.54	100.0	19.97	100.0	-11.35	100.0	15.76	100.0

Source: OeNB.

Note: ppt = percentage points.

Table A4

Growth in business services exports along the intensive and the extensive margin: 2010 to 2012

	Total export growth		Total export growth				Manufacturing							
			Service sectors		Manufacturing		High technology		Medium-high technology		Medium-low technology		Low technology	
	ppt	%	ppt	%	ppt	%	ppt	%	ppt	%	ppt	%	ppt	%
Intensive margin	15.79	92.6	16.90	95.4	16.45	86.4	7.43	40.6	24.86	111.4	16.28	119.9	28.47	148.0
Extensive margin	0.01	0.1	-0.41	-2.3	0.30	1.6	9.59	52.5	-4.64	-20.8	-4.94	-36.3	-12.76	-66.4
New export relations	1.80	10.6	1.71	9.6	5.36	28.2	9.12	49.9	5.01	22.5	6.21	45.8	2.96	15.4
Expired export relations	-1.79	-10.5	-2.12	-12.0	-5.06	-26.6	0.47	2.6	-9.65	-43.3	-11.15	-82.1	-15.72	-81.8
Subliminal development	1.25	7.3	1.22	6.9	2.28	12.0	1.25	6.9	2.09	9.4	2.23	16.4	3.52	18.3
Total	17.05	100.0	17.71	100.0	19.03	100.0	18.27	100.0	22.31	100.0	13.58	100.0	19.23	100.0

Source: OeNB.

Note: ppt = percentage points.