4. East-West Economic and Financial Linkages in Europe

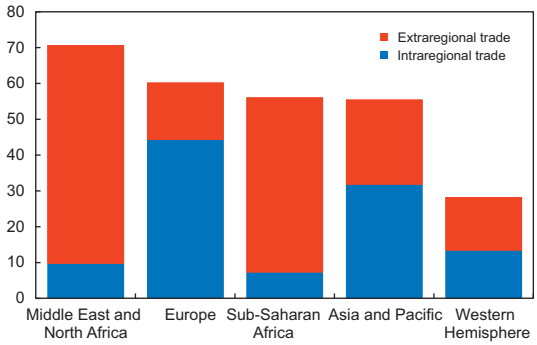
Trade and financial linkages between Western Europe and Central, Eastern, and Southeastern Europe (CESEE) have increased sharply over the past one and a half decades.[48] *Production chains of Central Europe have become integrated with those of Germany, and Western European banks have come to dominate banking systems in most CESEE countries. As a result, east-west spillovers have become much stronger and no longer go from west to east only. Financial shocks and trade shocks have become interdependent, with shocks to credit flows in one direction quickly followed by shocks to trade flows in the other direction.*

This chapter takes stock of the economic and financial ties between CESEE and Western Europe and assesses the associated spillovers. The first section documents stylized facts about trade, foreign direct investment (FDI), and banking linkages between the two parts of Europe. It goes on to quantify how shocks originating in Western Europe affect economic developments in CESEE and vice versa. A final section offers policy conclusions.

Stylized Facts

The economies of Europe are highly open and strongly trade-integrated with one another. Trade in goods is equivalent to about 60 percent of GDP—more than in any other region of the world, except for the Middle East and North Africa, where oil exports account for a large share of GDP (Figure 4.1). Three-fourths of European trade is trade within Europe, making its intraregional trade the largest of all regions in terms of GDP, as well as relative to total trade.

Figure 4.1
Selected Global Regions: Total Trade Flows, 2010
(Sum of imports and exports of goods relative to GDP, percent)



Sources: IMF, Direction of Trade Statistics; IMF, World Economic Outlook database; and IMF staff calculations.

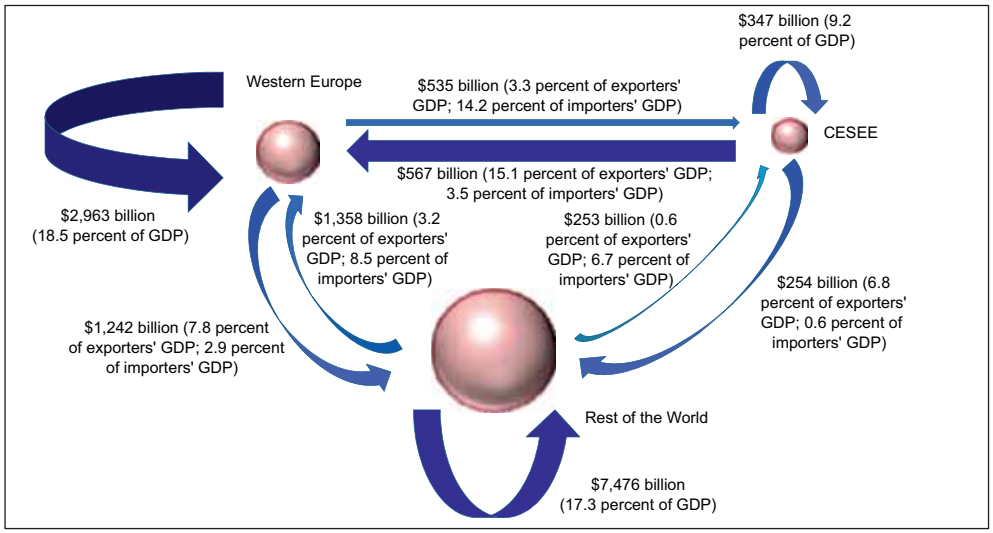
Western Europe dominates intra-European trade. The bulk of European trade takes place within Western Europe, and Western Europe is CESEE's premier export market. In 2010, Western European nations exported goods worth 18.5 percent of GDP to other Western European nations—more than twice as much as they exported to the rest of the world and far more than the 3.3 percent of GDP that went to CESEE (Figure 4.2). Conversely, Western Europe is easily CESEE's main trading partner, ahead of trade within CESEE, owing to its larger economic size.

CESEE's importance has increased rapidly. Economic and financial ties between the countries of Europe have become much stronger since the mid-1990s. The general globalization trend was accentuated by the liberalization of the economies in CESEE, the eastward expansion of the EU, the deepening of integration within the EU, and closer ties of the EU with non-members in the region. Moreover, the economies of CESEE grew much

Note: The main authors of this chapter are Özge Akıncı and Phakawa Jeasakul.

[48] The Western Europe and CESEE regions closely match the regions referred to elsewhere in this report as advanced and emerging Europe, with important exceptions. Western Europe comprises Austria, Belgium, Cyprus, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, and Spain in the euro area; and Denmark, Iceland, Norway, Sweden, Switzerland, and the United Kingdom. CESEE comprises the Czech Republic, Hungary, Poland, the Slovak Republic, and Slovenia in Central Europe; Estonia, Latvia, and Lithuania in the Baltics; and Albania, Bosnia and Herzegovina, Bulgaria, Croatia, FYR Macedonia, Montenegro, Romania and Serbia in Southeastern Europe; and Belarus, Moldova, Russia, and Ukraine in the European CIS; and Turkey.

Figure 4.2
Europe and Rest of the World: Trade Flows of Goods, 2010[1]

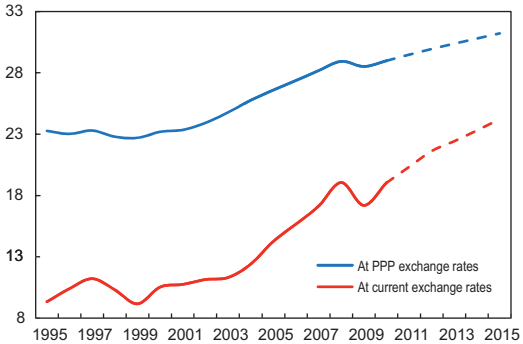


Sources: IMF, Direction of Trade Statistics; IMF, World Economic Outlook database; and IMF staff calculations.
[1]The thickness of arrows reflects the magnitude of trade flows relative to exporting country's GDP. The size of bubbles reflects the share of individual region's GDP in the world's GDP (Western Europe: 25 percent; CESEE: 6 percent; rest of the world: 69 percent).

faster than those of Western Europe, lifting their relative economic weight to almost 30 percent of Western Europe (Figure 4.3).

Western Europe's exports to CESEE are growing the fastest, and CESEE has become a more important export destination for Western Europe than the Asia and Pacific region or the Western Hemisphere (Figure 4.4). CESEE's role as a source for Western European imports has also increased rapidly, although it remains less important in that role than the Asia and Pacific region. CESEE sources a rapidly growing share of its own imports from the Asia and Pacific region, which now accounts for 15 percent of all CESEE imports, up from 6 percent in 1995.

Figure 4.3
CESEE: GDP Relative to Western Europe, 1995–2015[1,2]
(Percent)



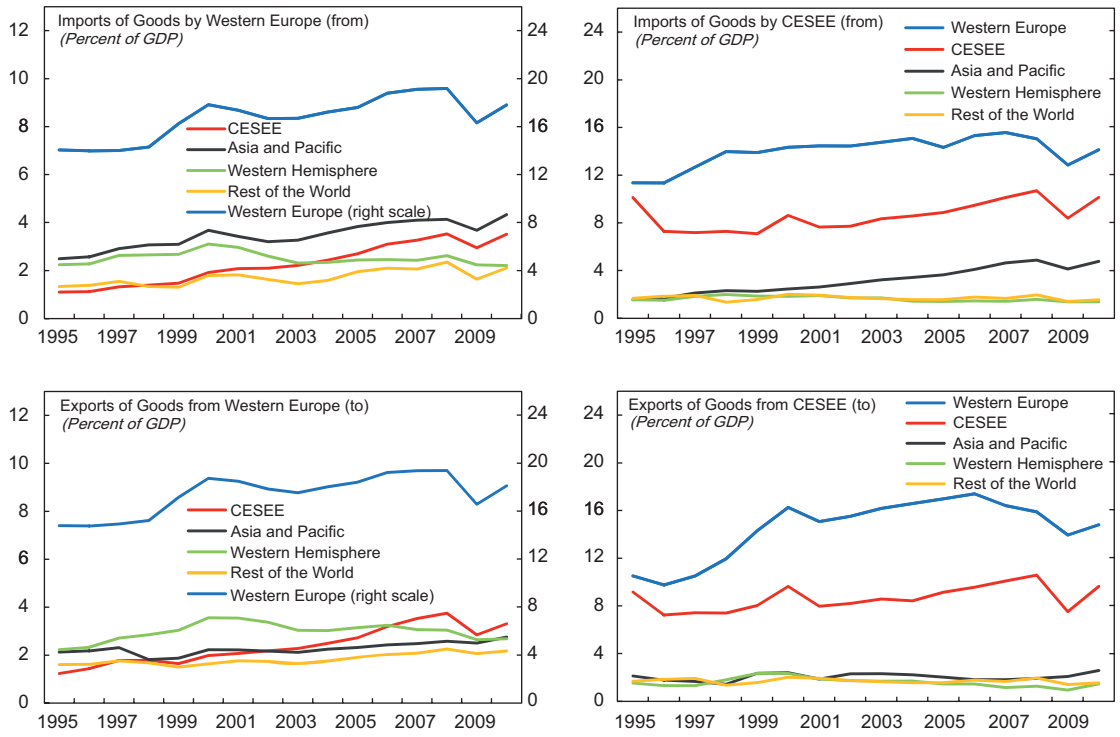
Sources: IMF, World Economic Outlook database; and IMF staff calculations.
[1]Includes Serbia from 1997; Bosnia & Herzegovina from 1998; Kosovo from 2000; and Montenegro from 2001.
[2]Projections from 2011.

Trade interconnectedness—Europe as a whole

Germany, Italy, and the Netherlands are the economies most tightly connected through trade linkages with the rest of Europe, but Hungary and Poland have begun to play important roles too. Trade interconnectedness is gauged by an index that takes into account trade flows relative to economic size, import and export market shares relative to what would be expected on the basis of relative economic sizes, and trade flows in absolute terms. For each country, it is measured by averaging that country's interconnectedness with all its partner countries in Europe or a subregion.[49] Looking at all

[49] Section (a) of the Annex describes in greater detail the construction of the trade interconnectedness index,

Figure 4.4
CESEE and Western Europe: Import and Export Shares by Region, 1995–2010



Sources: IMF, Direction of Trade Statistics; IMF, World Economic Outlook database; and IMF staff calculations.

intraregional trade in Europe, Western European economies are the ones most tightly connected in this way with their partner countries across the continent. Belgium, Germany, Italy, and the Netherlands come out on top (Table 4.1, column 1). However, Hungary and Poland also have leading positions and, indeed, score higher than many Western European economies.

Trade interconnectedness—East-West

Among countries of CESEE, those located in Central Europe and the Baltics are the most intertwined with Western Europe through trade. Focusing on trade flows with Western Europe, other countries from Western Europe (rather than from CESEE) show the highest degree of trade interconnectedness, indicating that trade ties within Western Europe are still stronger than between Western Europe and CESEE (Table 4.1, column 2). Poland and the Czech Republic are the two CESEE countries with the closest trade connections with Western Europe, although Russia is also important owing to its sizable energy trade. The importance of Central Europe, the Baltics, and Russia is also apparent from their relatively high trade in relation to their own GDP and/or that of their trading partners alone (Tables 4.2 and 4.3).

Among countries of Western Europe, Austria, Germany, and Italy are most enmeshed with CESEE through trade. Nevertheless, in trade with CESEE countries, economies from CESEE itself are again the most trade interconnected (Table 4.1, column 3), with Hungary, Russia, and Slovenia more involved in trade with CESEE than any country in Western Europe. The importance of Austria, Germany, and Italy is already apparent from their sizable trade with CESEE relative to their GDP. Trade between Germany and CESEE

which is based on the methodology for assessing trade interconnectedness in IMF (2011a).

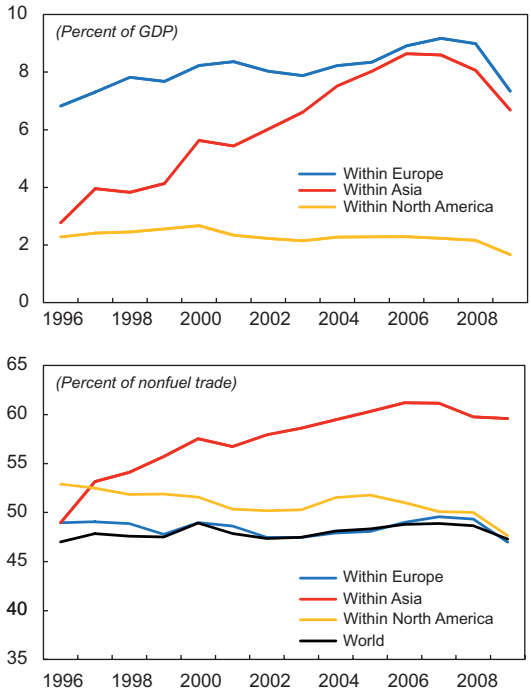
corresponds to 10.6 percent of CESEE's GDP and 12 percent of Germany's GDP. For Austria, trade with CESEE is equivalent to 16.6 percent of its GDP.

Cross-border production chains

Cross-border production chains appear to play an important role in Europe, but there is little evidence that they are being ramped up there as they are in Asia. The importance of cross-border production chains can be measured by the size of trade in intermediate goods.[50] In intra-European trade, they account for about 7 percent of GDP, which is higher than in Asia or in North America (Figure 4.5). However, this share has remained largely constant over time, in contrast to Asia, where it has been growing rapidly as the international division of labor has taken off (IMF, 2010d). This picture does not change dramatically if one focuses on trade between Western Europe and CESEE. Again, the share of intermediate goods trade remains rather constant over time (Figure 4.6).

Within the European cross-border production chain, Western Europe occupies an upstream position, that is, it contributes predominantly core components rather than specializing in final assembly. According to a study by Koopman and others (2010), the indirect exports of the old EU member states (the EU-15), representing exports used by importing countries to produce goods for export to third countries, are more important than the imported contents embodied in their exports. By contrast, for the EU's new member states (NMS), the relative importance of indirect exports and imports embedded in exports is reversed. In other words, on balance, EU-15 countries take the upstream position of the production chain, while the NMS occupy a more downstream position (Table 4.4). Similarly, Japan and the United States hold upstream positions in

Figure 4.5
Selected Global Regions: Intraregional Trade of Intermediate Goods, 1996–2009



Sources: IMF, World Economic Outlook database; United Nations Comtrade database; and IMF staff calculations.

Asia and North America, respectively, while newly industrialized countries and emerging markets in Asia, as well as Canada and Mexico, specialize in downstream activities.[51]

Germany and Central Europe hold key positions in cross-border production chains

Production chains between Western Europe and CESEE run primarily between Central Europe and Germany. The extent of intermediate goods trade varies dramatically between the different parts of CESEE and Western Europe. It exceeds 10 percent of GDP in the case of Central Europe and is also substantial in the Baltics (Figure 4.7). Its role is more subdued for Southeastern Europe and low

[50] Intermediate goods are the sum of the following categories in the Comtrade statistics: processed nonfuel industrial supplies (BEC 22), parts and accessories for capital goods (BEC 42), and parts and accessories for transportation equipment (BEC 53).

[51] Table 4.5 also indicates an upstream position for Russia. However, this primarily reflects Russian exports of energy and raw materials rather than critical intermediate goods.

Table 4.1

Europe: Degree of Trade Interconnectedness[1,2]

Within Europe		With Western Europe		With CESEE	
Germany	0.457	Netherlands	0.620	Hungary	0.467
Netherlands	0.382	Germany	0.570	Slovenia	0.406
Italy	0.353	Belgium	0.547	Russia	0.392
Belgium	0.327	United Kingdom	0.480	Austria	0.362
Hungary	0.308	France	0.404	Germany	0.354
Poland	0.296	Italy	0.383	Poland	0.353
Russia	0.288	Sweden	0.351	Ukraine	0.339
Austria	0.288	Denmark	0.345	Italy	0.325
Slovenia	0.278	Switzerland	0.322	Bulgaria	0.314
United Kingdom	0.264	Spain	0.313	Slovak Republic	0.306
Sweden	0.243	Norway	0.298	Serbia	0.292
France	0.235	Finland	0.248	Romania	0.269
Denmark	0.229	Poland	0.239	Belarus	0.261
Czech Republic	0.226	Luxembourg	0.219	Czech Republic	0.261
Slovak Republic	0.224	Ireland	0.211	Lithuania	0.250
Bulgaria	0.215	Austria	0.205	Macedonia, FYR	0.242
Lithuania	0.214	Czech Republic	0.192	Moldova	0.231
Romania	0.200	Iceland	0.190	Croatia	0.222
Finland	0.197	Russia	0.183	Latvia	0.208
Ukraine	0.186	Lithuania	0.178	Bosnia & Herzegovina	0.204
Serbia	0.183	Estonia	0.175	Turkey	0.181
Latvia	0.178	Portugal	0.152	Estonia	0.178
Estonia	0.176	Slovenia	0.150	Netherlands	0.168
Spain	0.169	Hungary	0.150	Greece	0.153
Switzerland	0.168	Latvia	0.147	Finland	0.151
Norway	0.163	Slovak Republic	0.142	Sweden	0.146
Croatia	0.157	Malta	0.135	Belgium	0.128
Macedonia, FYR	0.157	Romania	0.131	Denmark	0.124
Belarus	0.142	Bulgaria	0.117	Montenegro, Rep. of	0.119
Moldova	0.138	Greece	0.112	Albania	0.112
Turkey	0.135	Cyprus	0.109	France	0.082
Greece	0.134	Croatia	0.092	United Kingdom	0.070
Bosnia & Herzegovina	0.134	Turkey	0.089	Cyprus	0.047
Luxembourg	0.112	Montenegro, Rep. of	0.083	Norway	0.040
Iceland	0.107	Albania	0.078	Spain	0.038
Montenegro, Rep. of	0.101	Serbia	0.075	Malta	0.034
Ireland	0.100	Macedonia, FYR	0.072	Iceland	0.032
Albania	0.095	Bosnia & Herzegovina	0.064	Switzerland	0.029
Malta	0.081	Moldova	0.044	Luxembourg	0.015
Cyprus	0.076	Ukraine	0.033	Ireland	0.000
Portugal	0.072	Belarus	0.022	Portugal	0.000

Sources: IMF, Direction of Trade Statistics; IMF, *World Economic Outlook*; and IMF staff calculations.

[1] The index is the weighted average of indicators representing the importance of bilateral trade between countries within Europe. See section (a) of the Annex for more detail.

[2] Names of countries in Western Europe are in blue, and those in CESEE are in red.

Table 4.2

CESEE and Western Europe: Bilateral Trade, 2010

(Percent of CESEE country's GDP)

	Germany	Italy	Netherlands	France	United Kingdom	Austria	Belgium	Spain	Sweden	Finland	Switzerland	Greece	Denmark	Norway	Ireland	Portugal	Luxembourg	Cyprus	Malta	Iceland	**Total**
Czech Republic	40.9	5.5	6.9	5.7	4.8	6.4	3.5	2.7	1.7	0.6	1.9	0.3	1.0	0.9	0.4	0.4	0.2	0.1	0.0	0.0	**84.0**
Hungary	33.2	7.2	5.4	6.4	5.2	7.3	2.8	3.3	1.3	0.5	1.4	0.4	0.9	0.2	0.4	0.4	0.1	0.0	0.0	0.0	**76.6**
Slovak Republic	27.6	7.2	4.7	7.8	3.5	9.6	2.3	2.6	1.7	0.4	1.2	0.4	0.8	0.2	0.2	0.3	0.1	0.2	0.0	0.0	**70.8**
Slovenia	21.9	17.3	3.0	7.0	2.0	11.0	1.9	1.8	0.8	0.3	1.2	0.4	0.7	0.2	0.2	0.2	0.2	0.0	0.0	0.0	**70.0**
Estonia	11.0	2.5	3.6	2.7	2.6	0.7	2.0	0.9	15.5	17.3	0.6	0.1	2.6	2.9	0.2	0.1	0.0	0.1	0.0	0.2	**65.7**
Poland	19.4	4.5	3.8	4.0	3.3	1.5	2.2	1.7	1.8	0.6	0.7	0.2	1.1	0.7	0.3	0.2	0.1	0.0	0.0	0.0	**46.1**
Lithuania	12.2	3.2	5.3	3.5	3.7	0.6	3.2	1.2	3.8	1.6	0.4	0.1	2.6	1.7	0.3	0.2	0.1	0.0	0.0	0.5	**44.3**
Bulgaria	10.7	8.0	2.1	3.5	1.6	2.6	2.5	2.3	0.5	0.2	0.7	6.3	0.4	0.1	0.1	0.3	0.1	0.2	0.0	0.0	**42.4**
Macedonia, FYR	14.1	5.6	2.1	0.6	4.5	1.9	1.0	1.3	0.3	0.0	0.7	7.1	0.3	0.1	0.2	0.3	0.0	0.0	0.0	0.0	**40.1**
Romania	11.6	8.4	2.2	4.6	1.8	2.2	1.3	1.6	0.4	0.2	0.7	0.9	0.3	0.1	0.3	0.3	0.0	0.1	0.0	0.0	**37.2**
Latvia	8.6	2.3	2.6	1.8	2.3	0.6	1.4	0.8	3.9	2.8	0.9	0.1	2.3	1.4	0.3	0.1	0.0	0.2	0.0	0.1	**32.6**
Albania	1.9	16.8	0.7	0.4	0.3	1.0	0.2	1.4	0.2	0.1	0.3	5.4	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	**28.8**
Croatia	6.4	7.7	1.3	0.9	0.7	3.4	0.6	0.5	0.3	0.1	0.5	0.3	0.2	0.1	0.1	0.0	0.4	0.1	0.3	0.0	**24.2**
Bosnia & Herzegovina	7.5	7.4	0.9	0.7	0.3	4.5	0.5	0.6	0.3	0.0	0.5	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	**24.1**
Moldova	7.4	7.2	1.3	1.4	2.0	1.0	0.6	0.4	0.3	0.2	0.3	1.0	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	**23.9**
Serbia	6.3	5.7	1.2	1.3	0.6	2.7	0.7	0.5	0.0	0.1	0.6	1.0	0.3	0.0	0.2	0.0	0.0	0.1	0.0	0.0	**21.3**
Belarus	5.6	1.3	5.7	0.5	1.9	0.6	0.6	0.2	0.3	0.3	0.6	0.0	0.2	0.3	0.0	0.0	0.0	0.1	0.0	0.0	**18.4**
Turkey	4.4	2.3	1.2	1.9	1.6	0.3	1.0	1.1	0.4	0.2	0.6	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.0	**15.8**
Russia	4.6	1.7	2.3	1.5	0.7	0.4	0.8	0.7	0.6	1.1	0.2	0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	**15.5**
Ukraine	5.1	3.0	1.3	1.0	0.7	1.1	0.6	0.6	0.2	0.4	0.6	0.2	0.3	0.2	0.0	0.1	0.0	0.1	0.0	0.0	**15.5**
Montenegro, Rep. of	2.0	4.4	1.2	0.5	0.2	2.2	0.2	0.5	0.1	0.0	0.3	3.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**15.0**
CESEE	**10.6**	**3.6**	**2.7**	**2.6**	**1.8**	**1.7**	**1.3**	**1.2**	**0.9**	**0.8**	**0.6**	**0.5**	**0.4**	**0.3**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**29.3**

Sources: IMF, Direction of Trade Statistics; IMF, World Economic Outlook database; and IMF staff calculations.

Table 4.3

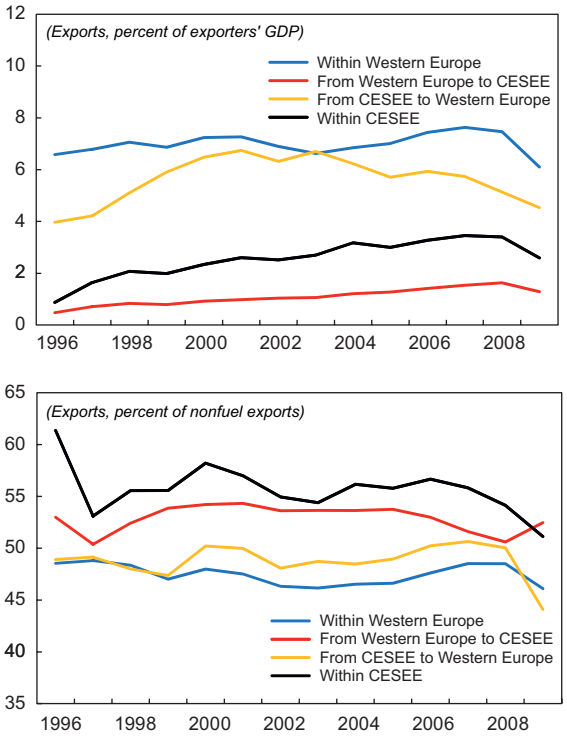
CESEE and Western Europe: Bilateral Trade, 2010

(Percent of Western European country's GDP)

	Russia	Poland	Czech Republic	Turkey	Hungary	Slovak Republic	Romania	Slovenia	Ukraine	Bulgaria	Lithuania	Croatia	Estonia	Belarus	Serbia	Latvia	Bosnia & Herzegovina	Macedonia, FYR	Albania	Moldova	Montenegro, Rep. of	**Total**
Austria	1.7	1.9	3.3	0.6	2.5	2.2	0.9	1.4	0.4	0.3	0.1	0.5	0.0	0.1	0.3	0.0	0.2	0.0	0.0	0.0	0.0	**16.6**
Netherlands	4.3	2.3	1.7	1.1	0.9	0.5	0.5	0.2	0.2	0.1	0.2	0.1	0.1	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	**12.8**
Finland	6.9	1.2	0.5	0.5	0.3	0.1	0.1	0.1	0.2	0.0	0.2	0.0	1.4	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0	**12.0**
Germany	2.0	2.7	2.4	1.0	1.3	0.7	0.6	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	**12.0**
Belgium	2.5	2.2	1.4	1.6	0.8	0.4	0.5	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	**10.7**
Malta	0.0	0.4	0.3	5.2	0.3	0.1	0.4	0.1	0.4	0.1	0.1	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**9.6**
Sweden	2.0	1.9	0.7	0.6	0.4	0.3	0.2	0.1	0.1	0.1	0.3	0.0	0.7	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	**7.5**
Italy	1.2	1.0	0.5	0.8	0.5	0.3	0.7	0.4	0.2	0.2	0.1	0.2	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	**6.5**
Greece	1.9	0.3	0.2	0.8	0.2	0.1	0.5	0.1	0.1	1.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.2	0.0	0.0	**5.9**
Denmark	0.8	1.7	0.6	0.5	0.4	0.2	0.1	0.1	0.1	0.1	0.3	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	**5.3**
Cyprus	0.3	0.5	0.5	0.0	0.2	0.6	0.6	0.1	0.6	0.3	0.0	0.4	0.1	0.3	0.1	0.3	0.0	0.0	0.0	0.0	0.0	**4.9**
Switzerland	0.7	0.6	0.7	0.8	0.4	0.2	0.2	0.1	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.2**
Luxembourg	0.4	1.0	0.6	0.5	0.3	0.2	0.1	0.2	0.0	0.1	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.1**
Iceland	0.9	0.7	0.2	0.2	0.1	0.0	0.0	0.0	0.2	0.0	1.3	0.0	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	**4.0**
France	0.8	0.7	0.4	0.6	0.3	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**3.8**
Spain	0.7	0.6	0.4	0.6	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**3.2**
United Kingdom	0.4	0.7	0.4	0.5	0.3	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**3.0**
Norway	0.7	0.8	0.4	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.2	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	**2.9**
Ireland	0.3	0.6	0.4	0.4	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**2.6**
Portugal	0.3	0.4	0.4	0.4	0.2	0.1	0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**2.3**
Western Europe	**1.4**	**1.3**	**1.0**	**0.7**	**0.6**	**0.4**	**0.4**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**6.9**

Sources: IMF, Direction of Trade Statistics; IMF, World Economic Outlook database; and IMF staff calculations.

Figure 4.6
CESEE and Western Europe: Trade of Intermediate Goods in Europe, 1996–2009



Sources: IMF, World Economic Outlook database; United Nations Comtrade database; and IMF staff calculations.

for the European CIS countries. From Western Europe's perspective, intermediate goods are much more prominent in Germany's trade than in that of other Western European countries. The growing importance of cross-border production chains for Central Europe and Germany is also reflected in a high rate of import growth relative to domestic demand growth in these countries.

Cross-border production between Germany and Central Europe primarily involves transportation equipment and capital goods, which account for more than half of the trade between these countries. For automobiles, which account for 14 percent of German exports to Central Europe and 18 percent of Central Europe's exports to Germany, two-thirds of German exports are parts and components, whereas the remaining third is final vehicles. For Central Europe, the composition is about 50 percent each. Production chains are highly interwoven and Central Europe does not act simply as an assembly location. Nevertheless, Germany supplies more intermediate inputs. This pattern of production chains broadly applies to electrical equipment and other machinery as well.

FDI of Western Europe in CESEE is sizable, further boosting East-West trade

FDI also binds the economies of Western Europe and CESEE together. While the FDI of CESEE countries in Western Europe is negligible, its flow in the other direction became substantial as CESEE economies liberalized, state-owned enterprises were put up for sale, their domestic markets became attractive for retail activity, and cross-border productions chains were set up. FDI in CESEE comes almost exclusively from Western Europe and reaches a considerable size, especially in Bulgaria, the Czech Republic, Estonia, Hungary, and the Slovak Republic (Figure 4.8). Over time, the destinations of this investment changed as the appeal of Southern Europe started to pale in comparison with that of CESEE. For example, German FDI flows into CESEE were strong during 2007–10, but negative in Portugal (Figure 4.9).

FDI linkages tend to reinforce and cement trade linkages over time. FDI in the tradable sector boosted CESEE's imports and exports. A sizable part of FDI was directed toward the tradable sector as firms from Western Europe outsourced parts of their production processes to CESEE. Once production facilities in CESEE came onstream, they sourced inputs from their western parents and shipped much of their output back to Western European markets. FDI in the nontradable sector did not boost CESEE's exports, but did lead to increase of imports—at least in the short term.

Banking system linkages are strong—much of CESEE's banking system is owned by Western European banks

Financial linkages of Western Europe with CESEE increased rapidly from 2003 onward. Western

Table 4.4

Selected Countries: Measures of Vertical Specialization across Borders, 2004

	Imported contents embodied in gross exports (percent)	Indirect exports sent to third countries (percent)[1]	Upstream or downstream position[2]
Asia			
Japan	12.2	30.8	2.5
Hong Kong	27.5	19.5	0.7
Philippines	41.9	29.4	0.7
Korea	33.9	23.1	0.7
Taiwan	41.4	27.2	0.7
Malaysia	40.5	25.0	0.6
Thailand	39.7	18.4	0.5
China	35.7	12.5	0.4
Europe			
Russia	10.2	31.2	3.1
European Union (EU-15)	11.4	20.9	1.8
EU New Member States	30.8	11.3	0.4
North America			
United States	12.9	26.9	2.1
Canada	28.1	12.2	0.4
Mexico	48.0	10.0	0.2

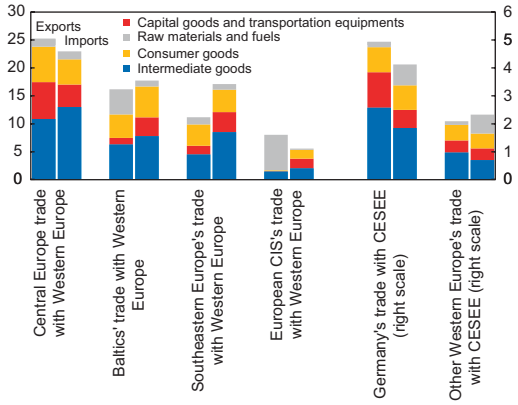
Sources: Koopman and others (2010); and IMF staff calculations.
[1] Includes indirect exports that return to home country.
[2] Based on indirect exports sent to third countries divided by imported contents embodied in gross exports.

banks acquired subsidiaries in CESEE to which their head offices would extend ample financing for local credit expansion. Direct cross-border lending to nonbanks in CESEE also took off. As a result, exposure of BIS-reporting banks, most of them headquartered in Western Europe, became large relative to the size of CESEE banking systems, easily exceeding 50 percent of local banking system assets in a number of countries (Figure 4.10). The importance of Western Europe's banks to CESEE is even greater when the locally funded assets of Western European-owned subsidiaries are also taken into account. According to that yardstick, Western Europe's banks account for the vast majority of banking sector assets everywhere in CESEE, except in Turkey and the European CIS countries (Figure 4.11). Austrian-owned, French-owned, and Italian-owned banks are particularly active in CESEE.

Reverse financial linkages from CESEE to Western Europe are much less pronounced. While Western European banks dominate CESEE banking systems, their operations in the region make up only a small fraction of Western Europe's banking systems, and their asset exposure to CESEE represents less than 3 percent of their assets on average (Figure 4.12). Only the CESEE operations of Austrian and Greek banks are considerable relative to their domestic banking systems, corresponding to about 30 percent and 15 percent of their assets, respectively. The funding of banks in the west from CESEE sources, mainly in the form of nonbank deposits, is also small relative to the funding provided by Western European banks to CESEE and especially relative to the size of Western Europe banking system assets.

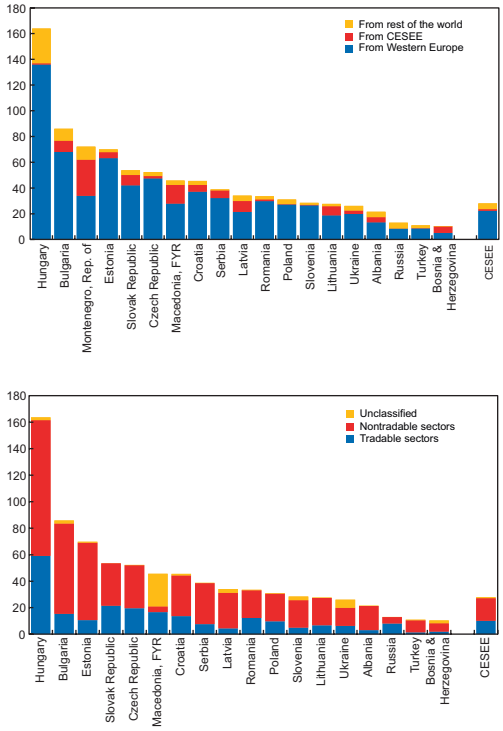
The expansion of Western European banks in CESEE boosted Western Europe's exports. Much of the ample financing that was made available by Western Europe's banks to CESEE during the boom period of 2003–08 was spent on imports

Figure 4.7
Selected European Regions: Imports and Exports between CESEE and Western Europe by Components, 2009
(Percent of GDP)



Sources: IMF, World Economic Outlook database; United Nations Comtrade database; and IMF staff calculations.

Figure 4.8
CESEE: Inward Foreign Direct Investment Stock by Origins of Funds and Sectors, 2008[1,2]
(Percent of GDP)



Sources: Central banks of Russia and Turkey; IMF, *International Financial Statistics*; IMF, World Economic Outlook database; Vienna Institute for International Economic Studies (wiiw), Database on Foreign Direct Investment; and IMF staff estimates.
[1]The number of total stock is based on international investment position data; the composition is based on the breakdown available from wiiw data.
[2]The tradable sector comprises agriculture, manufacturing, mining, and trade. The nontradable sector comprises communication and transportation, construction, financial intermediation, real estate, and utilities.

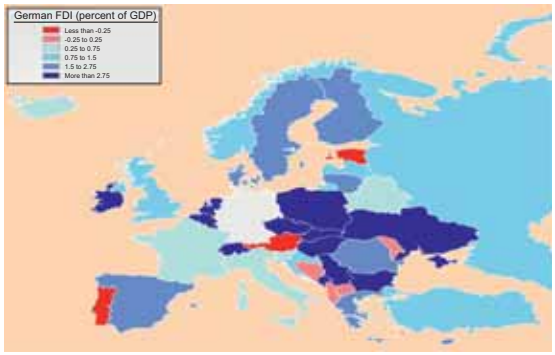
from Western Europe. The more financing CESEE countries received from western banks, the stronger their imports from Western Europe grew. An estimated 57 cents per euro of western bank financing ended up being spent on imports from Western Europe (Figure 4.13). The boom period boosted trade and financial exposure at the same time, just as the slump in the wake of the global financial crisis dealt a simultaneous blow to both.

Spillovers and Quantifications

Economic and financial linkages between the two parts of Europe are obviously significant, but what can be said about the strength of spillovers from economic developments in Western Europe to CESEE and vice versa? Europe's experience in the run-up to and the aftermath of the global financial crisis suggests that spillovers are large. For example, exports to CESEE lifted Germany's annual export growth during 2003–08 from 6½ percent to 8¼ percent, thereby directly adding ¾ percentage points to GDP growth. And in the 2009 recession, exports to CESEE worsened the contraction of Germany's exports from 16¼ percent to 12¼ percent. This directly added 1¾ percentage points to the fall of German output.[52] Similarly, because buoyant financing from western banks during 2003–08 played a pivotal role in CESEE's economic boom, the sudden end of that financing from late 2008 helped plunge the economies of CESEE into a deep recession (Bakker and Gulde, 2010).

[52] During 2003–08, Germany's GDP grew by an annual average of 1.9 percent. In 2009, it contracted by 5.1 percent. The quantifications of the contributions from exports to CESEE are meant to give a sense of the orders of magnitude involved. They do not take into account second-round effects through changes of income and imports.

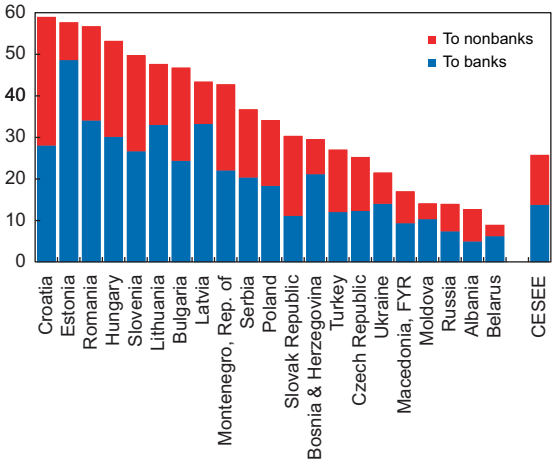
Figure 4.9
Europe: Accumulated German Foreign Direct Investment, 2007–10
(Percent of recipient country's average GDP)



Sources: Deutsche Bundesbank; IMF, World Economic Outlook database; and IMF staff calculations.

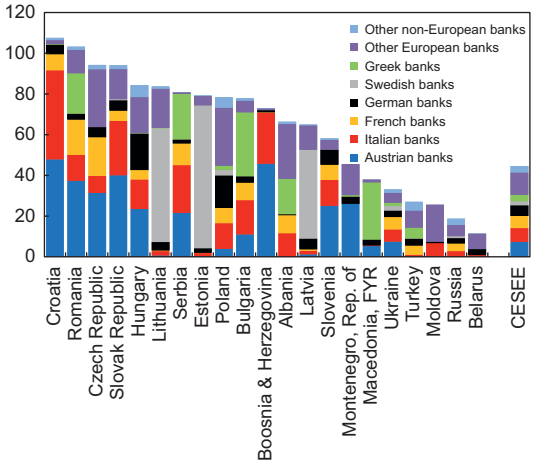
This section offers three approaches for the quantification of spillovers. First, it quantifies the size of output spillovers through the trade channel based on import elasticities and the structure of bilateral trade relationships. Second, it employs a vector autoregression (VAR) framework to study the dynamics of growth shocks originating in one part of Europe on GDP in the other part of Europe. Third, it uses a dynamic panel regression to quantify the effects of a funding shock from

Figure 4.10
CESEE: Funding from BIS-Reporting Banks, 2010
(BIS-reporting banks' exposure relative to banking system's total assets, percent)



Sources: BIS, Locational Banking Statistics (Table 6); IMF, *International Financial Statistics*; and IMF staff calculations.

Figure 4.11
CESEE: Consolidated Claims of BIS-Reporting Banks by Country of Bank Ownership, 2010
(Relative to banking system's total assets, percent)



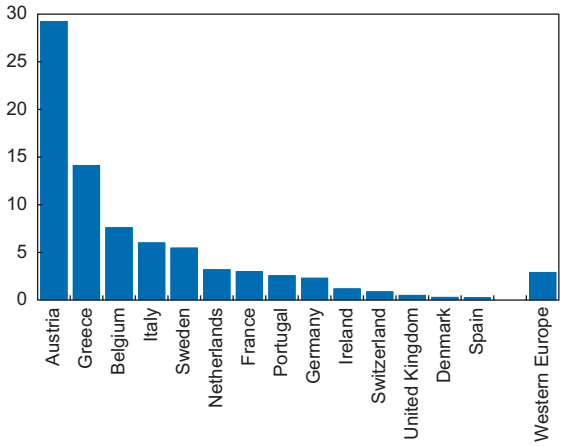
Sources: BIS, Consolidated Banking Statistics (Table 9B); IMF, *International Financial Statistics*; and IMF staff calculations.

Western European banks on credit growth and economic growth in CESEE.

Spillovers through the trade channel are considerable, ranging from 0.3 percent to 2.4 percent additional growth in individual countries for a 1 percent growth shock in the rest of Europe. The quantification exercise first estimates the effect of an output shock on countries' imports and then calculates the effect on partner countries' exports using historical trade shares. Their export multipliers are set equal to 1—essentially assuming that income effects are offset by higher imports of final goods and intermediate inputs embedded in exports.[53] On this basis, spillovers can be quite high, especially for small, highly-open economies, such as Malta and Moldova.[54] Larger economies that have considerable trade relations with non-European countries, such as Russia and Turkey, are subject to much lower spillovers (Figure 4.14). Aggregation across the countries of Western Europe and

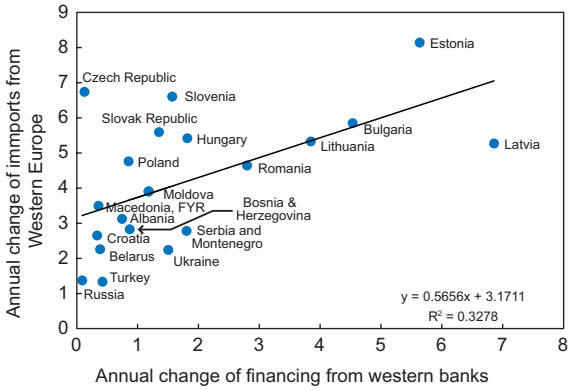
[53] Section (b) of the Annex explains the methodology, based on that in the U.S. Spillover Report (IMF, 2011h), in more detail.
[54] Spillover coefficients can exceed one as shocks to trading partners' GDP tend to raise their imports more than one-for-one.

Figure 4.12
Western Europe: Consolidated Claims of BIS-Reporting Banks on CESEE by Country of Bank Ownership, 2010[1]
(Relative to banking system's total assets, percent)



Sources: BIS, Consolidated Banking Statistics (Table 9B); IMF, *International Financial Statistics*; and IMF staff calculations
[1]Total assets for Western Europe do not include Norway due to data unavailability.

Figure 4.13
CESEE: Funding from Western Banks and Imports from Western Europe, 2003–08[1]
(Percent of GDP)



Sources: BIS, Locational Banking Statistics (Table 6); IMF, Direction of Trade Statistics; IMF, World Economic Outlook database; and IMF staff calculations.
[1]For Estonia, Latvia and Lithuania, 2002–07.

CESEE suggests that a 1 percent growth shock in Western Europe would add 0.4 percentage point to growth in CESEE. Conversely, a 1 percent growth shock emanating from CESEE would entail additional growth of just 0.1 percentage point in Western Europe.

Western growth shocks are felt one-for-one in the CESEE

The VAR framework confirms strong spillovers from Western Europe to CESEE, but reverse spillovers are manifest only when they emanate from Central Europe. The exercise explains growth in Western Europe and CESEE in terms of past growth in the two parts of Europe while controlling for growth in the rest of the world. It then studies the dynamic response of growth in one part of Europe to a growth shock in the other part of Europe.[55] A growth shock in Western Europe essentially translates one-to-one into additional growth in CESEE (Figure 4.15, panel 1). The effects on Central Europe and the rest of CESEE seem to be in the same order of magnitude, although the effect on Central Europe has higher statistical significance (Figure 4.15, panel 2). A growth shock in CESEE has no significant effect on growth in Western Europe (Figure 4.15, panel 3). However, given the closer ties between Central Europe and Western Europe, a shock emanating from the former does have a statistically significant effect on the latter. Over time, growth in Western Europe is lifted by about one-third of the increase in growth in Central Europe (Figure 4.15, panel 4).

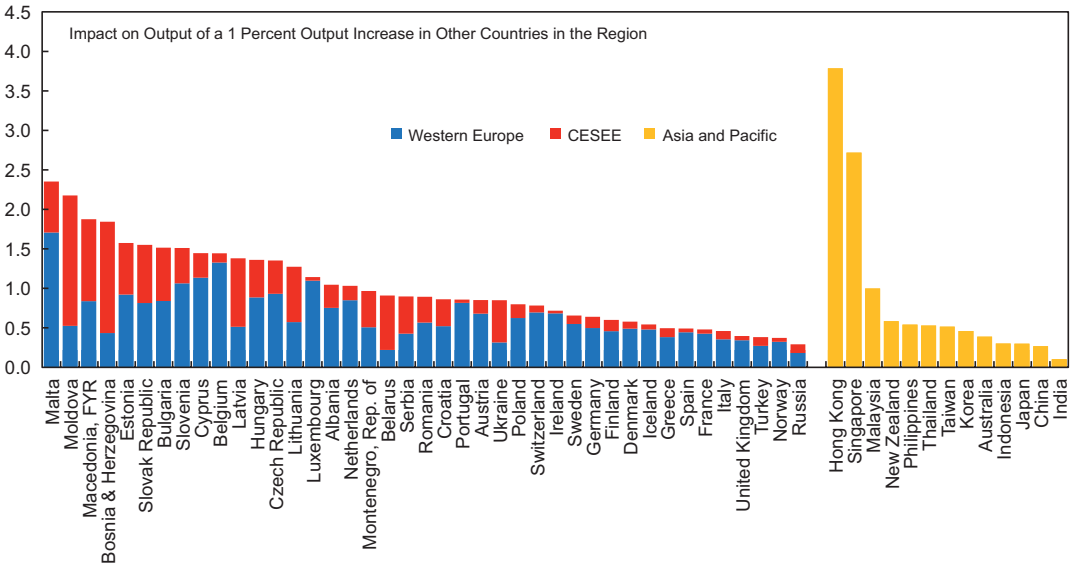
Funding shocks from western banks have a big impact on credit in CESEE

Funding from western banks has a strong impact on credit and domestic demand growth in CESEE. The exercise first estimates the dynamic response of credit expansion to changes in the exposure of western banks to banks in CESEE countries, using data on 15 countries in the region during 2003–10.[56] Over time, about 80 percent of any exposure increase is found to translate into additional credit

[55] Section (c) of the Annex explains the methodology in more detail.

[56] Suitable data for the other CESEE countries are not available. Section (d) of the Annex explains the methodology in more detail.

Figure 4.14
Asia and Europe: Impact of Output Spillovers through the Trade Channel[1]
(Percent)



Sources: IMF, Direction of Trade; IMF, World Economic Outlook database; United Nations Comtrade database; and IMF staff calculations.
[1]Section (b) of the Annex explains the methodology of the analysis.

(Figure 4.16, panel 1). In a second step, the exercise considers the association of credit growth with domestic demand and GDP. Over time, a 1 percentage point increase in real credit growth is associated with a 0.35 percentage point increase in real domestic demand and a 0.28 percentage point increase in real GDP (Figure 4.16, panel 2). Putting the two steps together suggests that the financial spillovers from western banks to economic activity in CESEE are strong. Indeed, the financing provided by western banks during 2003–08 added 1½ percentage points to CESEE's annual GDP growth according to these estimations.[57]

Despite the pivotal role of western banks in CESEE's banking systems, several factors mitigate concerns that financial stability in CESEE would be at risk in an adverse scenario where western banks came under intense strain at home; for example, in the context of a sharp escalation of the tension in euro area debt markets. Multiple lines of defense in home and host countries and the experience during the 2008/09 crisis suggest that such severe spillovers would not materialize easily. Pressured western banks would in the first instance turn to support available at home, such as liquidity from the ECB against eligible collateral, emergency liquidity assistance from their central banks, and any government support schemes that would be put in place under the circumstances. Scope for obtaining funding from their subsidiaries in CESEE would be rather limited, as host supervisors would step in if compliance with liquidity and capital ratios of subsidiaries were at risk. Violations would ultimately lead to a painful loss of managerial control by parent banks.

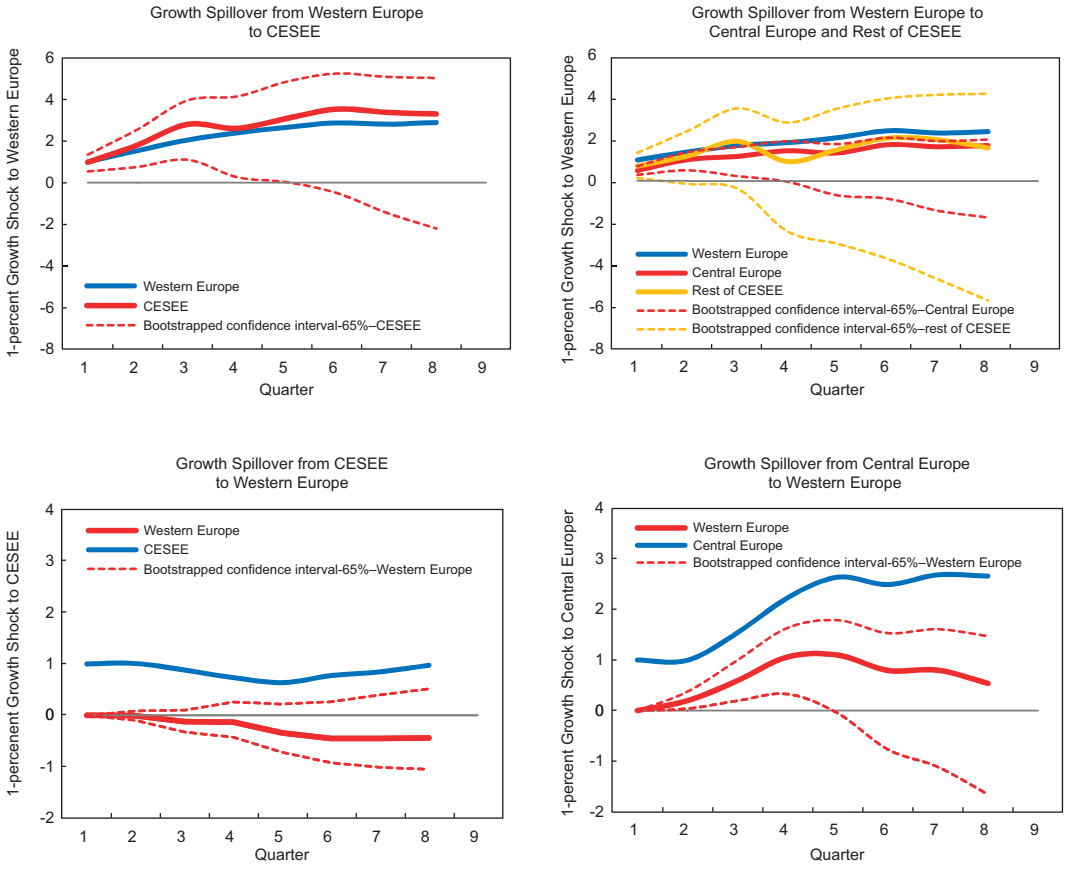
An adverse scenario would, however, likely trigger a renewed credit crunch, as western parent banks would persistently scale back their exposure to subsidiaries, and cross-border loans to nonbanks would be rolled over only sparingly. Moreover, unaffiliated banks in CESEE countries that rely heavily on wholesale funding could come under pressure. In sum, the outcome would not be unlike the experience during the global financial crisis in 2008/09 when CESEE escaped financial meltdown, and banking crises occurred only in the

[57] During this period, annual average growth in CESEE was 6½ percent.

Figure 4.15

Europe: Growth Spillovers between CESEE and Western Europe[1]

(Accumulated response of GDP, percent)



Sources: IMF, World Economic Outlook database; and IMF staff calculations.

[1]Section (c) of the Annex explains the methodology of the analysis.

two countries where reliance of local banks on wholesale funding was particularly high (Latvia and Ukraine).

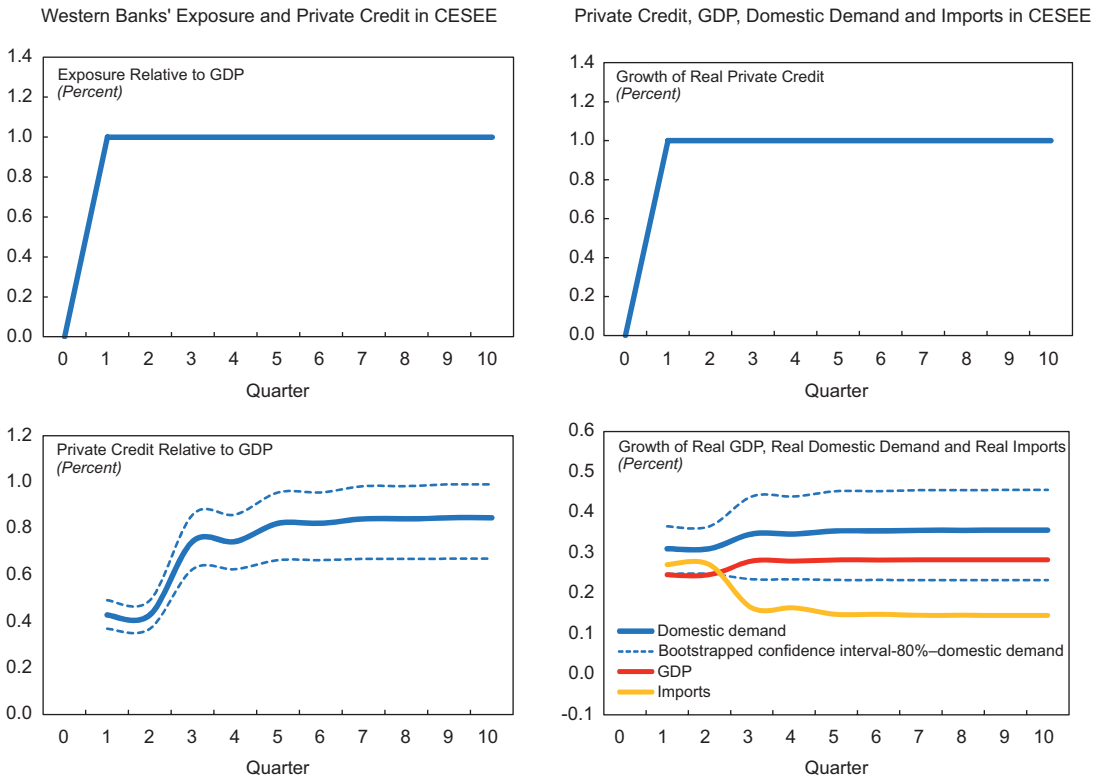
Policy Implications

Linkages give rise to good and bad spillovers…

Spillovers, which are the inevitable side effect of linkages, entail challenges for policymakers. Strong linkages mean that economic developments and policies in one part of Europe have considerable repercussions in other parts. This by itself is neither good nor bad, because favorable developments can spill over as much as unfavorable ones can. However, it complicates macroeconomic policymaking, because when economies are buffeted by far-away shocks, traditional policy tools might become less effective and business cycles are amplified. For example, the guardians of financial stability in Western European countries with banking sectors heavily exposed to CESEE need to monitor possible repercussions for the domestic financial system closely. Conversely, policymakers in CESEE might find it difficult to control a credit boom through traditional monetary policy tools if domestic banks have ample access to financing from foreign parent banks. And the interactions

Figure 4.16

Europe: Credit Spillovers from Western Europe to CESEE[1]



Sources: BIS, Locational Banking Statistics (Table 6); IMF, *International Financial Statistics*; IMF, World Economic Outlook database; and IMF staff calculations.

[1]Section (d) of the Annex explains the methodology of the analysis.

between financial and trade spillovers might exacerbate business cycles.

…as economies advance through cross-border integration…

These policy challenges should not distract from the fundamental benefits of economic and financial integration between Western Europe and CESEE. Tight integration is the result of economic liberalization and reform across CESEE, as well as in Western Europe, together with deliberate integration efforts as the EU expanded eastward. This has allowed countries to specialize according to their comparative advantages, firms to exploit economies of scale, and consumers to benefit as firms have faced stiffer competition. In particular, it has allowed western firms to extend their production chains to the east, thereby improving their competitiveness in global markets while contributing to the economic development of host countries. From this perspective, integration has been mutually beneficial and was rightly embraced by policymakers.

…and policymakers need to take note

Economic policies need to be fully attuned to the presence of spillovers to be effective. This requires three things. First, a broader range of economic and financial developments needs to be monitored and the linkages and associated spillovers have to be properly understood. This way, the domestic repercussions from seemingly far-away developments will not come as a surprise and can be addressed by domestic policies in a timely

manner. Second, policymakers need to switch to tools that are still effective in an interlinked economic setting. For instance, if traditional monetary policy could not contain the overheating associated with a foreign-funded credit boom, perhaps fiscal tightening and prudential measures—possibly coordinated with home supervisors—still could. Third, if linkages lead to an amplification of business cycles, policymakers must be prepared to use tools more aggressively.

Annex

(a) Constructing a Trade Interconnectedness Index

The trade interconnectedness index (TII) is the weighted average of indicators capturing the importance of bilateral trade between countries for a group of N countries. The weight reflects the closeness of trade relationships.

Specifically, the TII for country i is $TII_i = \frac{1}{N-1}\sum_j \frac{1}{closeness_{ij}} importance_{ij}$, where $importance_{ij}$ is the average of nine indicators gauging the importance of bilateral trade between country i and j, and $closeness_{ij}$ is the measurement of how directly two countries trade with each other.

The $importance_{ij}$ indicator is composed of nine different criteria, eight of which measure the importance of imports and exports relative to an individual country's economy as well as to that of trading partners. These include:

1. M_{ij}/Y_i and M_{ji}/Y_j
2. X_{ij}/Y_i and X_{ji}/Y_j
3. $(M_{ij}/M_i)/(Y_j/\bar{Y}_{\sim i})$ and $(M_{ji}/M_j)/Y_i/\bar{Y}_{\sim j})$
4. $(X_{ij}/X_i)/(Y_j/\bar{Y}_{\sim i})$ and $(X_{ji}/X_j)/Y_i/\bar{Y}_{\sim j})$,

where M_{ij} (X_{ij}) is imports (exports) of country i from (to) country j; M_i (X_i) is imports (exports) of country i; Y_i is GDP of country i; and $\bar{Y}_{\sim i}$ is aggregate GDP of all other countries except country i.

These individual indicators take the value of 1 (otherwise 0) when the underlying measurement exceeds the specified threshold, which is set at the 75th percentile for each criterion.

For the ninth criterion, the indicator is based on the size of bilateral trade: $(M_{ij} + X_{ij})$ relative to trade of all countries. For this indicator, the threshold is set at the 90th percentile to capture only substantial bilateral trade pairs.

The $closeness_{ij}$ measurement is based on the notion of how directly countries are connected through trade. The construction of this measurement consists of two steps.

The first step is to specify what could be considered an important trade linkage. The analysis takes the view that a bilateral trade linkage between country i and country j is important if the $importance_{ij}$ indicator takes the values of at least 4/9 (that is, four criteria specified above must be met). Then, two countries may be connected directly, or their connection may occur through third countries.

The second step is to count the distance between country i and country j, which in turn provides the value of $closeness_{ij}$, being defined as the inverse of the shortest distance. For example, if two countries share an important bilateral trade linkage and are thus connected directly, the shortest distance is 1 and the closeness is also 1. In contrast, if two countries are connected only through another country that has important trade linkages to both, the shortest distance is 2 and the closeness is ½.

Once both $importance_{ij}$ and $closeness_{ij}$ are constructed, the TII can be computed. This can be done for any specific group of countries. For instance, when the degree of trade interconnectedness of Europe as a whole is of interest, the TII is calculated based on all European countries. On the other hand, when the degree of trade interconnectedness with Central Europe is of interest, the TII is calculated with respect to countries in Central Europe (that is, computing the weighted average of $importance_{ij}$ where j represents all countries in Central Europe).

(b) Quantifying Output Spillovers through the Trade Channel

The analysis aims at quantifying the magnitude of output spillovers through the trade channel based on the structure of bilateral trade relationships within the region.

The analysis relies on two key assumptions. One is that the export multiplier (that is, the magnitude of output change due to export change) is equal to 1; thus, the analysis does not account for additional

output spillovers within the economy, leakages of domestic demand to imports, and intermediate imports essential for production. Another is that additional output spillovers across countries are not considered.

The analysis estimates the percentage change in output in country *i* owing to a 1 percent change in output in country *j*, which is denoted by $s_i|_j = \left(\frac{\Delta Y_i}{Y_i}\right) / \left(\frac{\Delta Y_j}{Y_j}\right)$, where Y_i and Y_j are output in country *i* and *j*, respectively.

Based on the assumption of unitary export multiplier, the change in output in country *i* results from the change in exports from country *i* to country *j* (owing to a change in output in country *j*), which is, in fact, imports from country *i* by country *j*. Then, $\left(\frac{\Delta Y_i}{Y_i}\right) = \theta_{ji}\left(\frac{\Delta M_j}{Y_i}\right) = \theta_{ji}\left(\frac{Y_j}{Y_i}\right)\left(\frac{\Delta M_j}{Y_j}\right) = \theta_{ji}\left(\frac{Y_j}{Y_i}\right)\left(\frac{M_j}{Y_j}\right)\left(\frac{\Delta M_j}{M_j}\right)$, where θ_{ji} is country *j*'s share of imports from country *i* and M_j is imports of country *j*.

Hence, $s_i|_j = \left(\frac{\Delta Y_i}{Y_i}\right) / \left(\frac{\Delta Y_j}{Y_j}\right) = \theta_{ji}\left(\frac{Y_j}{Y_i}\right)\left(\frac{M_j}{Y_j}\right)\varepsilon_j^M$, where ε_j^M is the output elasticity of imports, that is, $\varepsilon_j^M = \left(\frac{\Delta M_j}{M_j}\right) / \left(\frac{\Delta Y_j}{Y_j}\right)$. The value of $s_i|_j$ can be computed based on the structure of bilateral trade relationships reflected by θ_{ji}, the relative output ratio Y_j/Y_i, the import to GDP ratio M_j/Y_j, and the estimate for the output elasticity of imports ε_j^M. This is simply the regression coefficient of the percentage change in real imports on the percentage change in real GDP.

The analysis calculates the values of $s_i|_j$ for countries in Europe as well as in the Asia and Pacific region. Figure 4.14 presents the magnitude of output spillovers as a result of a 1 percent increase in output in all other countries in each region. This is simply the sum of $s_i|_j$ over all countries *j*.

(c) Growth Spillovers in a VAR Framework

The growth spillovers between Western Europe (WE) and CESEE are examined using a standard VAR framework containing quarterly real GDP growth for the sample period of 1997:Q2–2011:Q1, controlling for growth shocks that originated in the rest of the world (ROW). All major countries outside Europe are included in the VAR model to make sure that the estimated impulse responses purely reflect the spillovers between Western Europe and CESEE rather than reflecting similar responses to common global shocks.

For the purposes of this analysis, ROW includes the United States, emerging Asia (China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan Province of China, and Thailand), Japan and all other economies in the IMF's global projection model (Argentina, Australia, Brazil, Canada, Chile, Colombia, Israel, Mexico, New Zealand, Peru, South Africa, and Venezuela). PPP-based weights are used to construct the aggregate growth rates of ROW.

The following VAR models are estimated:

VAR-I: [*ROW*, *WE*, *CESEE*], and

VAR-II: [*ROW*, *WE*, *CE*, *CESEE* excluding *CE*].

The VAR-I system is estimated to study the spillovers between Western Europe and CESEE (Figure 4.15, left panels). The VAR-II model serves to examine the growth linkages between Western Europe and Central Europe (CE) on the one hand, and Western Europe and rest of CESEE, on the other hand (Figure 4.15, right panels).

The identification of the estimated shocks is achieved using Cholesky decompositions (that is, standard recursive ordering), and results presented in the text used the ordering of the countries indicated above. Robustness analysis for the result employing the methodology proposed by Bayoumi and Swiston (2008) was also carried out. More specifically, alternative orderings among countries were considered, and "averaged" impulse responses were calculated. The results are not affected by alternative orderings.

The model is estimated with five lags to ensure absence of autocorrelation in the estimated residuals. The results with four lags, which are more standard in the literature using quarterly data in the estimation of VAR models, yield quantitatively similar results.

(d) Credit Spillovers

The role of western bank lending to CESEE in the credit boom-bust cycles (Panel VAR-I) and the relationship between real credit growth and real economic activity growth (real GDP growth, real domestic demand growth, and real import growth) in CESEE (Panel VAR-II) are studied using a Panel VAR approach.

The baseline scenario considers 15 CESEE countries (Belarus, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, the Slovak Republic, Slovenia, Turkey, and Ukraine) and estimates the Panel VAR model using the least square dummy variable (LSDV) method between the 2003:Q1–2010:Q4 periods.[58]

PANEL VAR-I:

This model aims at characterizing the relationship between western bank lending and private credit expansion in CESEE. The first stage Panel VAR model, estimated with country-specific dummies using two lags, is as follows (for i = country index and t = 2003:Q1–2010:Q4):

$$CY_{i,t} = \alpha_i + \beta_1 CY_{i,t-1} + \beta_2 CY_{i,t-2} + \gamma FY_{i,t} + \varepsilon_{i,t},$$

where $CY_{i,t}$ is the quarterly change in private credit relative to GDP, and $FY_{i,t}$ is the quarterly change of BIS-reporting banks' exposure to CESEE banks relative to GDP.

PANEL VAR-II:

The second step of the analysis studies the relationship between real credit growth and real economic activity.

The second stage Panel VAR model, estimated with country-specific dummies using two lags, is as follows (for i = country index and t = 2003:Q1–2010:Q4):

$$Z_{i,t} = \delta_i + \pi_1 Z_{i,t-1} + \pi_2 Z_{i,t-2} + \rho C_{i,t} + \nu_{i,t},$$

where $Z_{i,t}$ is quarterly growth of real economic activity, and $C_{i,t}$ is quarterly growth of real private credit.

[58] Other CESEE countries are not considered because of data unavailability.