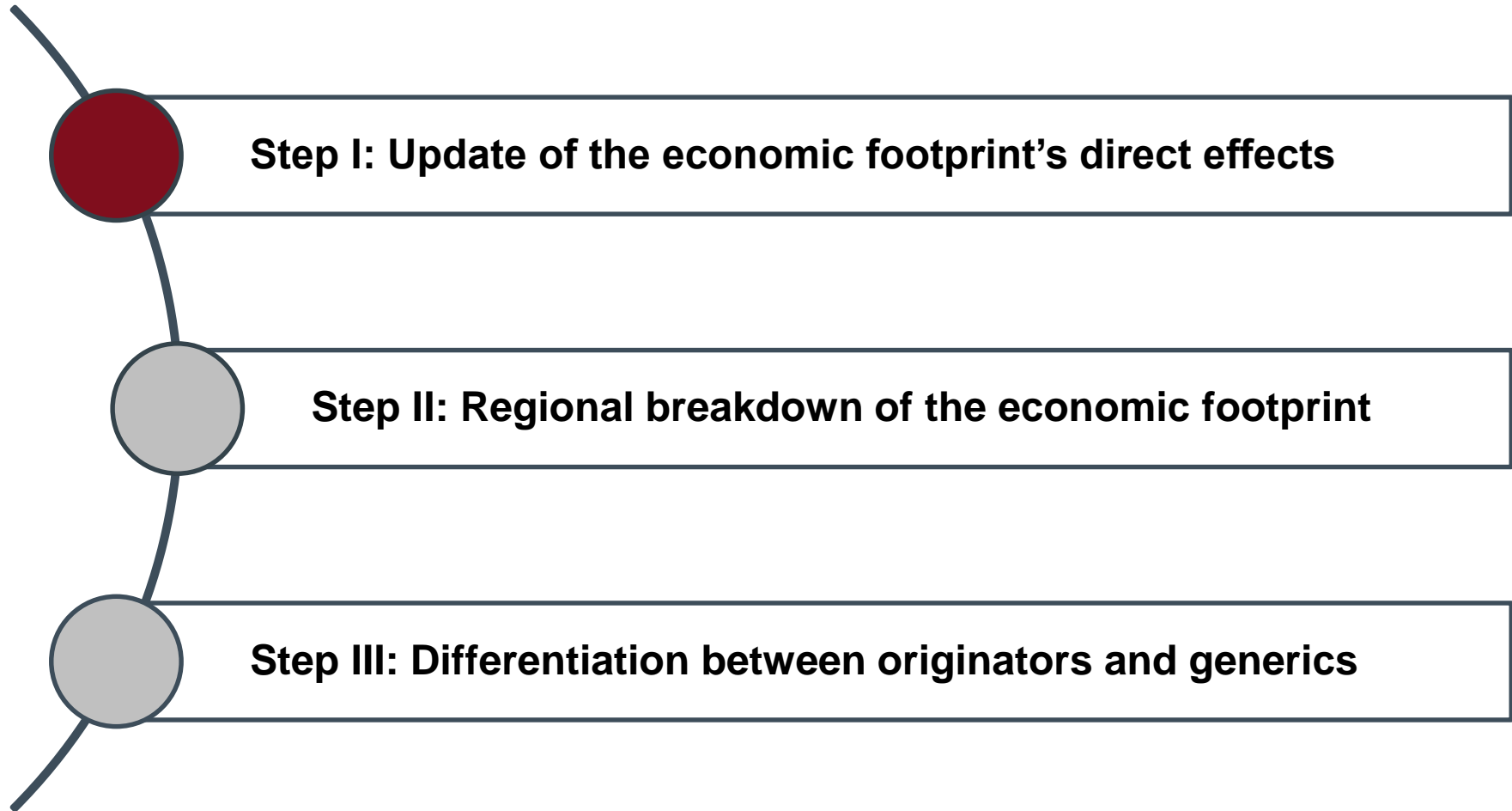


**Worldwide pharmaceutical industry  
(key findings of the IFPMA-study)**

**II ECPD REGIONAL CONFERENCE**  
PHARMACOECONOMICS BENEFITS DERIVED  
AND SOURCES OF PAYMENT



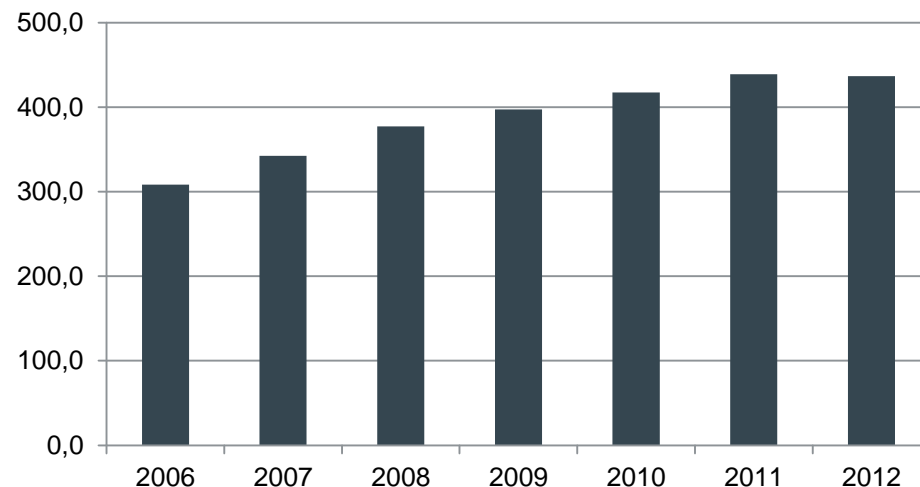
# Step I: Update of the economic footprint's direct effects



## Gross value added

- » The revised pharmaceutical industry's gross value added is starting in 2008 slightly lower.
- » The revised gross value added of the pharmaceutical industry amounts to USD 439.2 billion in 2011. The deviation amounts to -0.43 percent compared to the initial project.
- » One reason for the variation is the lower gross value added in the manufacturing sector in the SNA.

Gross value added in USD billion



	2006	2007	2008	2009	2010	2011	2012
<b>Revised: Gross value added (USD billion)</b>	308.2	342.5	377.3	397.3	417.6	439.2	436.8
<b>Gross value added (USD billion)</b>	306.5	342.1	378.3	398.5	421.1	441.0	
<b>Variation (in %)</b>	0.55%	0.12%	-0.25%	-0.30%	-0.84%	-0.43%	

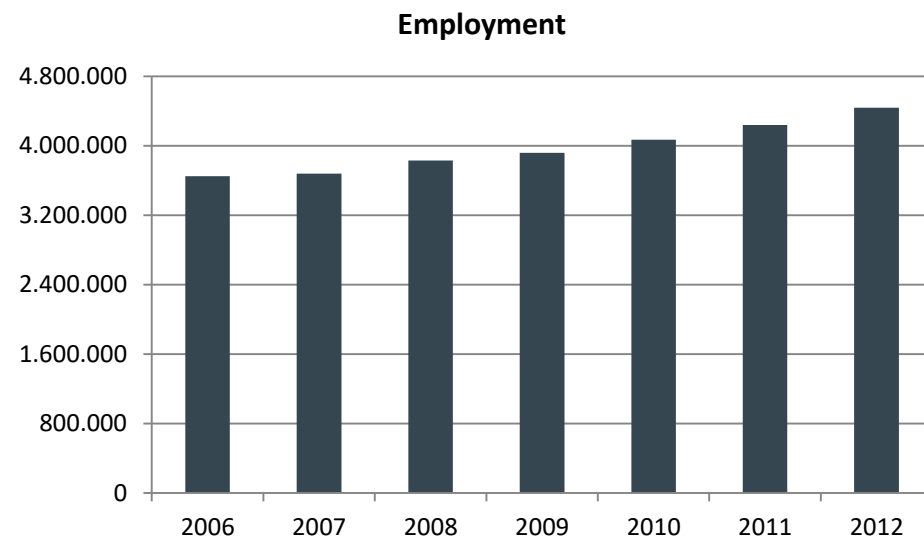
Source: Own calculation; INDSTAT (2014); STAN (2014); ESA (2014).

# Step I: Update of the economic footprint's direct effects



## Employment

- » The new employment figures exhibit a low level of increase compared to our previous result.
- » In 2011 our revised result show an increase of 10.000 employees in the pharmaceutical industry. This equates to a rise of 0.16 percent.
- » Main reasons for this variations are new employment data from INDSTAT, Eurostat, ILOSTAT and the OECD.



	2006	2007	2008	2009	2010	2011	2012
<b>Revised: Employment</b>	3,650,000	3,680,000	3,830,000	3,920,000	4,070,000	4,240,000	4,440,000
<b>Employment</b>	3,600,000	3,620,000	3,810,000	3,890,000	4,060,000	4,230,000	
<b>Variation (in %)</b>	1.37%	1.67%	0.50%	0.74%	0.25%	0.16%	

Source: Own calculation; INDSTAT (2014); STAN (2014); ESA (2014); ILOSTAT (2014).

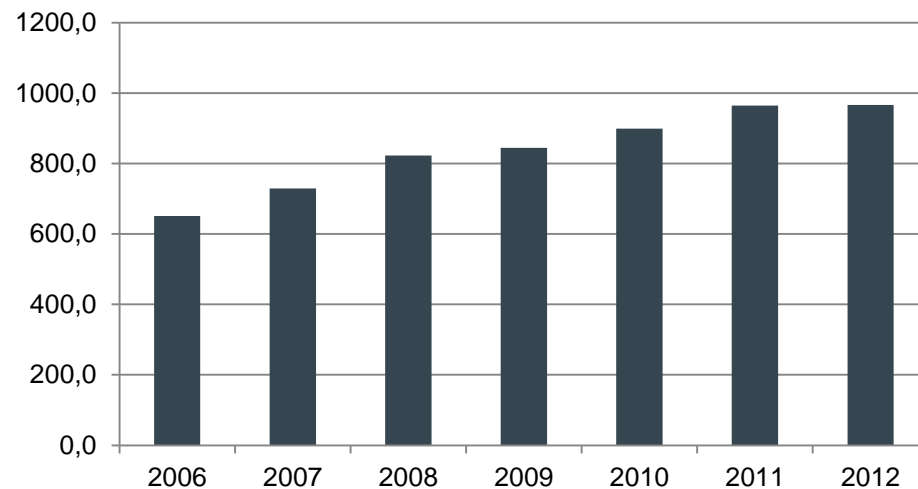
# Step I: Update of the economic footprint's direct effects



## Output

- » The revised output amounts to USD 966.1 billion in 2012.
- » The deviation concerning the new data base amounts to USD 23.8 billion or 2.53 percent in 2011.
- » Main reasons for the variations are the new Eurostat data concerning the value added ratio of the pharmaceutical industry.

Output in USD billion



	2006	2007	2008	2009	2010	2011	2012
<b>Revised: Output (USD billion)</b>	651.4	728.8	822.8	844.4	899.0	964.6	966.1
<b>Output (USD billion)</b>	634.2	718.7	793.5	831.9	884.4	940.8	
<b>Variation (in %)</b>	2.71%	1.42%	3.69%	1.51%	1.65%	2.53%	

Source: Own calculation; INDSTAT (2014); STAN (2014); ESA (2014).

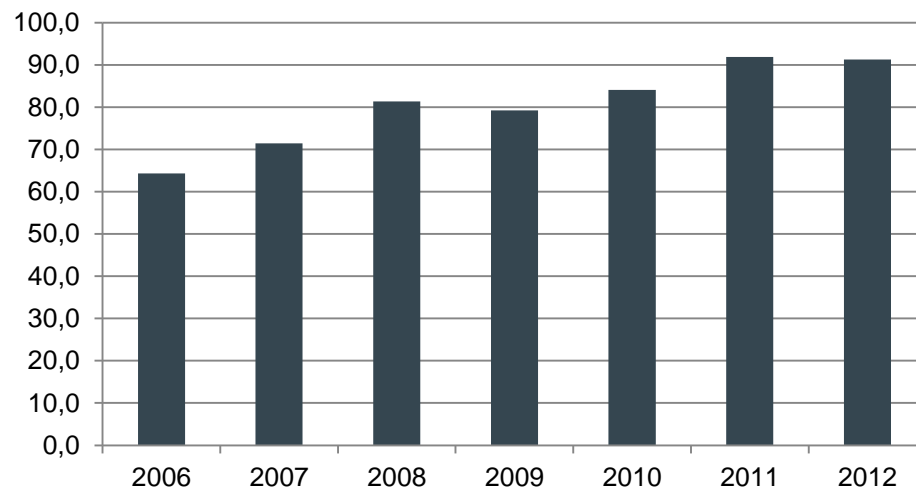
# Step I: Update of the economic footprint's direct effects



## Wages & salaries

- » The revised wages & salaries are below the figures of the initial project.
- » In 2011 the wages & salaries amounted to USD 91.9 billion. This value is 1.46 percent below the calculation from last year.
- » Reasons for the variations are the lower gross valued added and new Eurostat data concerning the relation GVA / W&S.

Wages & salaries in USD billion



	2006	2007	2008	2009	2010	2011	2012
<b>Revised: Wages &amp; salaries (USD billion)</b>	64.3	71.4	81.3	79.3	84.1	91.9	91.3
<b>Wages &amp; salaries (USD billion)</b>	67.4	75.9	82.9	80.4	85.7	93.3	
<b>Variation (in %)</b>	-4.50%	-5.90%	-1.95%	-1.43%	-1.88%	-1.46%	

Source: Own calculation; INDSTAT (2014); STAN (2014); ESA (2014).



**Step I: Update of the economic footprint's direct effects**

**Step II: Regional breakdown of the economic footprint**

**Step III: Differentiation between originators and generics**

## Step II: Regional breakdown of the economic footprint



### Gross value added I

- » The regional breakdown shows that Asia, Europe and Northern America are the most important producers of pharmaceuticals.
- » The gross value added in Asia amounts to USD 163.3 billion in 2012, i.e. nearly twice as large as in 2006.
- » The pharmaceutical industry in Europe creates a gross value added of USD 134.8 billion. The gross value added in Northern America amounts to USD 105.3 billion.
- » The gross value added in Asia showed a CAGR of 11.5 percent, which is in comparison to Europe with a CAGR of 4.4 percent and Northern America with 1.7 percent the highest one.

GVA (in USD billion)	2006	2007	2008	2009	2010	2011	2012
Asia	85.1	94.9	119.9	131.1	148.7	157.2	163.3
Europe	104.3	120.9	135.1	130.5	135.1	146.0	134.8
Northern America	95.4	100.4	94.2	110.5	104.9	102.6	105.3
Latin America	18.5	20.8	22.7	18.4	20.4	25.2	24.9
Africa	3.1	3.4	3.3	4.4	5.0	5.0	5.1
Oceania	1.8	2.2	2.1	2.4	3.5	3.2	3.3

Source: Own calculation; INDSTAT (2014); STAN (2014); ESA (2014).



## Step II: Regional breakdown of the economic footprint



### Gross value added II

- » The gross value added in Asia amounts to USD 163.3 billion in 2012, i.e. 37.4 percent of the global gross value added.
- » Europe has a share of 30.9 percent and Northern America has a share of 24.1 percent in the global gross value added.
- » In 2006 Europe had the biggest share of the global gross value added, followed by Northern America and Asia.

GVA (in %)	2006	2007	2008	2009	2010	2011	2012
Asia	27.6%	27.7%	31.8%	33.0%	35.6%	35.8%	37.4%
Europe	33.9%	35.3%	35.8%	32.8%	32.4%	33.3%	30.9%
Northern America	30.9%	29.3%	25.0%	27.8%	25.1%	23.4%	24.1%
Latin America	6.0%	6.1%	6.0%	4.6%	4.9%	5.7%	5.7%
Africa	1.0%	1.0%	0.9%	1.1%	1.2%	1.1%	1.2%
Oceania	0.6%	0.6%	0.6%	0.6%	0.8%	0.7%	0.8%

Source: Own calculation; INDSTAT (2014); STAN (2014); ESA (2014).

## Step II: Regional breakdown of the economic footprint



### Employment I

- » The regional breakdown shows that over 3 million people are working in the pharmaceutical industry in Asia.
- » The employment grew by 40 Percent since 2006 in Asia.
- » Around 750,000 employees are working in the European pharmaceutical industry.
- » The employment in the rest of the world amounts to around 690,000 people.
- » The employment figures in Asia grew at a CAGR of 5.7 percent, in Europe at a CAGR of 0.3 percent and in Northern America at a CAGR of -2.2 percent from 2006 to 2012.

Employment	2006	2007	2008	2009	2010	2011	2012
Asia	2,152,800	2,197,000	2,368,600	2,506,600	2,662,300	2,819,800	3,003,300
Europe	737,400	741,400	734,400	715,600	728,200	738,200	749,400
Northern America	310,300	307,000	301,500	283,000	280,700	275,900	271,400
Latin America	232,000	231,300	238,500	240,000	235,800	242,300	258,600
Africa	199,700	186,600	169,100	155,600	146,300	142,500	141,600
Oceania	17,000	17,100	17,100	18,100	16,800	18,200	18,300

Source: Own calculation; INDSTAT (2014); STAN (2014); ESA (2014); ILOSTAT (2014).

## Step II: Regional breakdown of the economic footprint

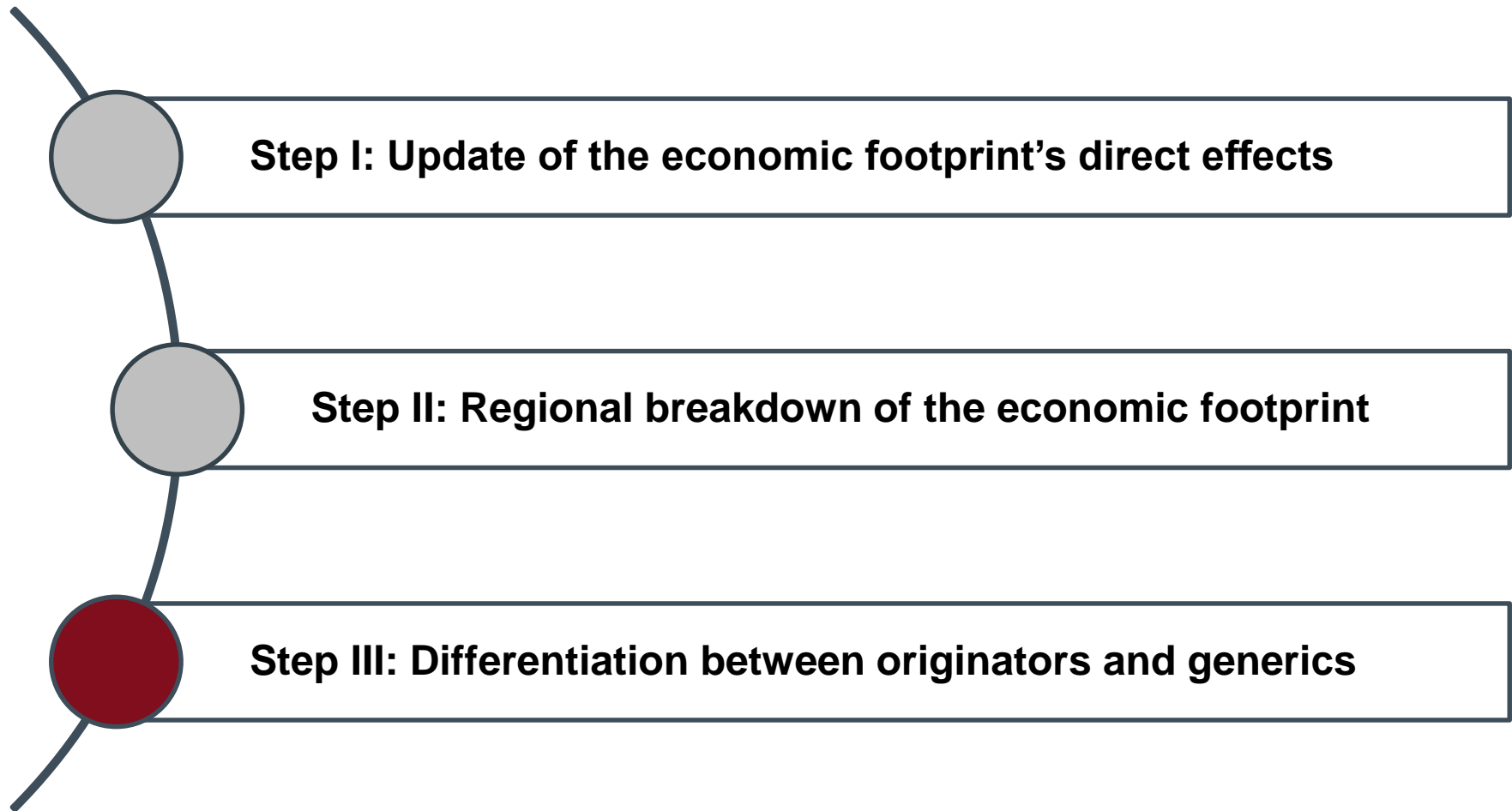


### Employment II

- » The largest contribution to employment takes place in Asia with 67.5 percent, followed by Europe with 16.9 percent.
- » Around 6 percent of the employees in the pharmaceutical industry are working in Northern America.
- » The global share of employed persons in Latin America amounts to 5.8 percent.

Employment (in %)	2006	2007	2008	2009	2010	2011	2012
Asia	59.0%	59.7%	61.9%	64.0%	65.4%	66.6%	67.6%
Europe	20.2%	20.1%	19.2%	18.3%	17.9%	17.4%	16.9%
Northern America	8.5%	8.3%	7.9%	7.2%	6.9%	6.5%	6.1%
Latin America	6.4%	6.3%	6.2%	6.1%	5.8%	5.7%	5.8%
Africa	5.5%	5.1%	4.4%	4.0%	3.6%	3.4%	3.2%
Oceania	0.5%	0.5%	0.4%	0.5%	0.4%	0.4%	0.4%

Source: Own calculation; INDSTAT (2014); STAN (2014); ESA (2014); ILOSTAT (2014).



# Step III: Differentiation between originators and generics



## Data

- » The limiting factor within the feasibility check of how to differentiate between originators and generics is the data availability.
- » There is currently no data available for the global nor the regional output and gross value added of generics.
- » The data is only available for value and volume sales (worldwide and on regional level).

## IMS Health:

- » We decided to use data from “The Global Use of Medicines: Outlook through 2017”, a report by the IMS Institute for Health Care.
- » The report displays value sales shares for originators, generics and other drugs (residual value).
- » Those figures are categorized for developed and pharmerging countries as well as for the rest of the world.

# Step III: Differentiation between originators and generics



## Methodology

- » Step III are substantially determined by the regional breakdown in Step II.
- » Disaggregation of the regional breakdown into 212 countries and classification into three categories:
  - Developed countries
  - Pharmerging countries
  - Rest of the world
- » Calculation of the gross value added:
  - Multiplication of the determined gross value added for the classified countries with the IMS data for value sales shares for originators, generics and other drugs.
- » Assumptions:
  - The value sales shares equal the gross value added shares.
  - The value creation process is identical for originators, generics and other drugs.
  - Differences within the production process of originators and generics lead to differences within the creation of value added; due to not available data this property is not taken into account.

# Step III: Differentiation between originators and generics



## Methodology

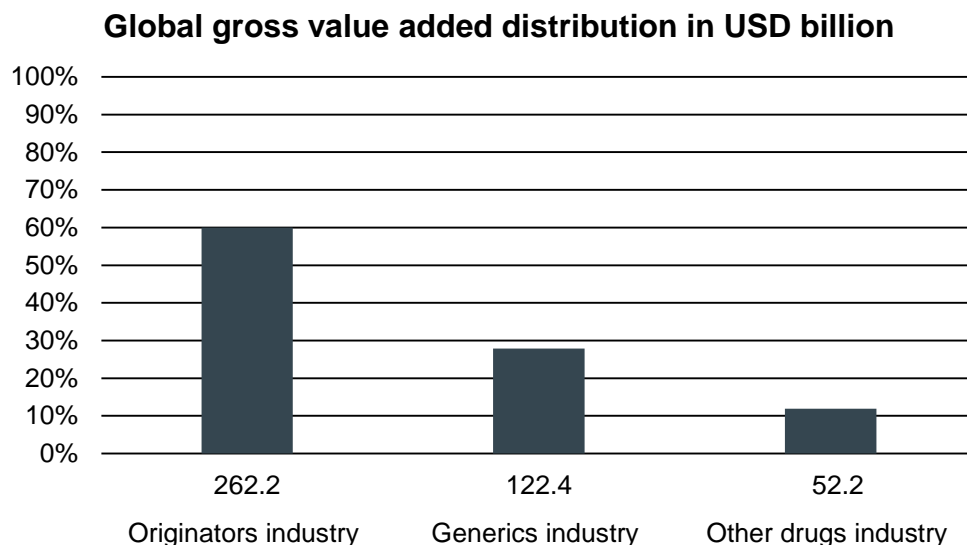
- » Calculation of the Employment:
  - Multiplication of the determined employment figures for the classified countries with the IMS data for value sales shares for originators, generics and other drugs.
- » Assumption:
  - The regional value sales shares equal the employment shares.
  - Adoption of derived country-specific labor productivity rates for the pharmaceutical industry for each industry (originators, generics and other drugs).
  - Differences in labor productivity for originators and generics lead to different employment figures; due to not available data this property is not taken into account.
- » Desirable objective:
  - Finding a methodological approach to consider differences within the value creating process and the labor productivity for each industry.
  - Taking into account region-specific mark-up's, R&D intensities, technological standard of the production processes, capital intensities, etc.

# Step III: Differentiation between originators and generics



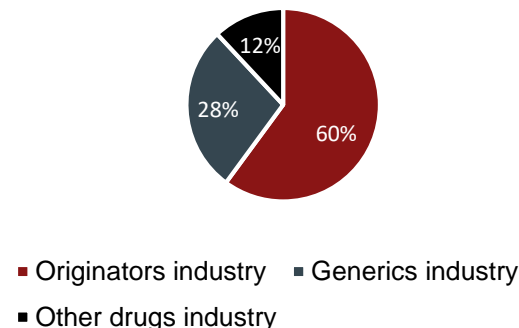
## Gross value added in 2012

- » The gross value added of the originators industry amounts to USD 262.2 billion in 2012 and represents therefore a share of 60 percent of the global pharmaceutical gross value added.
- » The generics industry reaches a gross value added of USD 122.4 billion, which refers to 28 percent of the global gross value added share.



Global gross value added distribution (USD billion)	2012	Shares
Pharmaceutical industry	436.8	100%
Originators industry	262.2	60%
Generics industry	122.4	28%
Other drugs industry	52.2	12%

## Global gross value added shares



Source: Own calculation; IMS (2013).



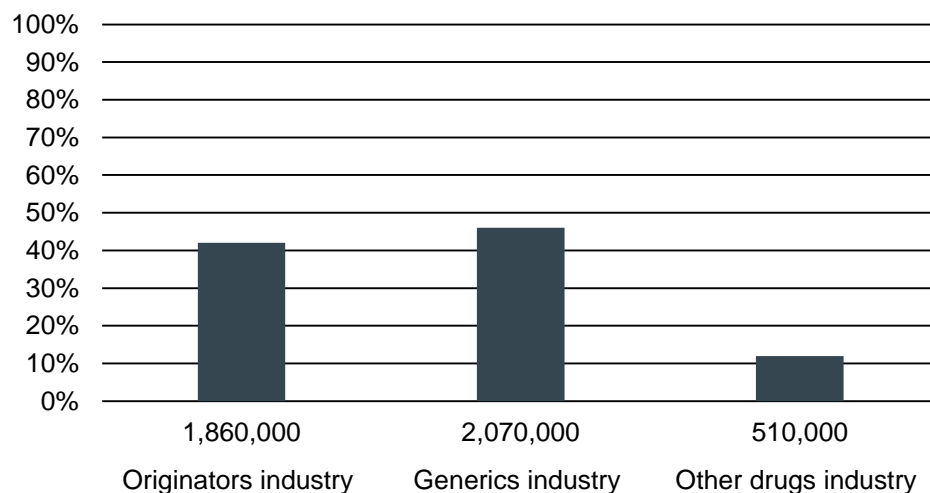
# Step III: Differentiation between originators and generics



## Employment in 2012

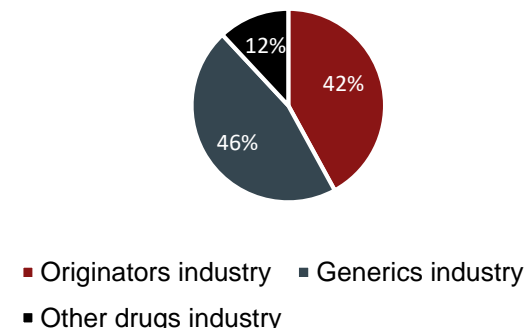
- » The employment figure for the generics industry adopts with 46 percent the leading position in terms of headcount.
- » The originators industry represents a proportion of 42 percent in the global market.
- » Even though the gross value added share of the originators industry is twice as high as in the generics industry, we found a higher employment in the generics industry.

Global employment distribution (headcount)



Global employment differentiation (headcount)	2012	Shares
Pharmaceutical industry	4,440,000	100%
Originators industry	1,860,000	42%
Generics industry	2,070,000	46%
Other drugs industry	510,000	12%

Global Employment Shares



Source: Own calculation; IMS (2013).



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