Centre for Economic Performance 21st Birthday Lecture Series

Comparing Real Wages: the McWage Index

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Comparing Real Wages

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TABLE 1: REAL WAGE RATES IN LONDON AND CANTON, 1704

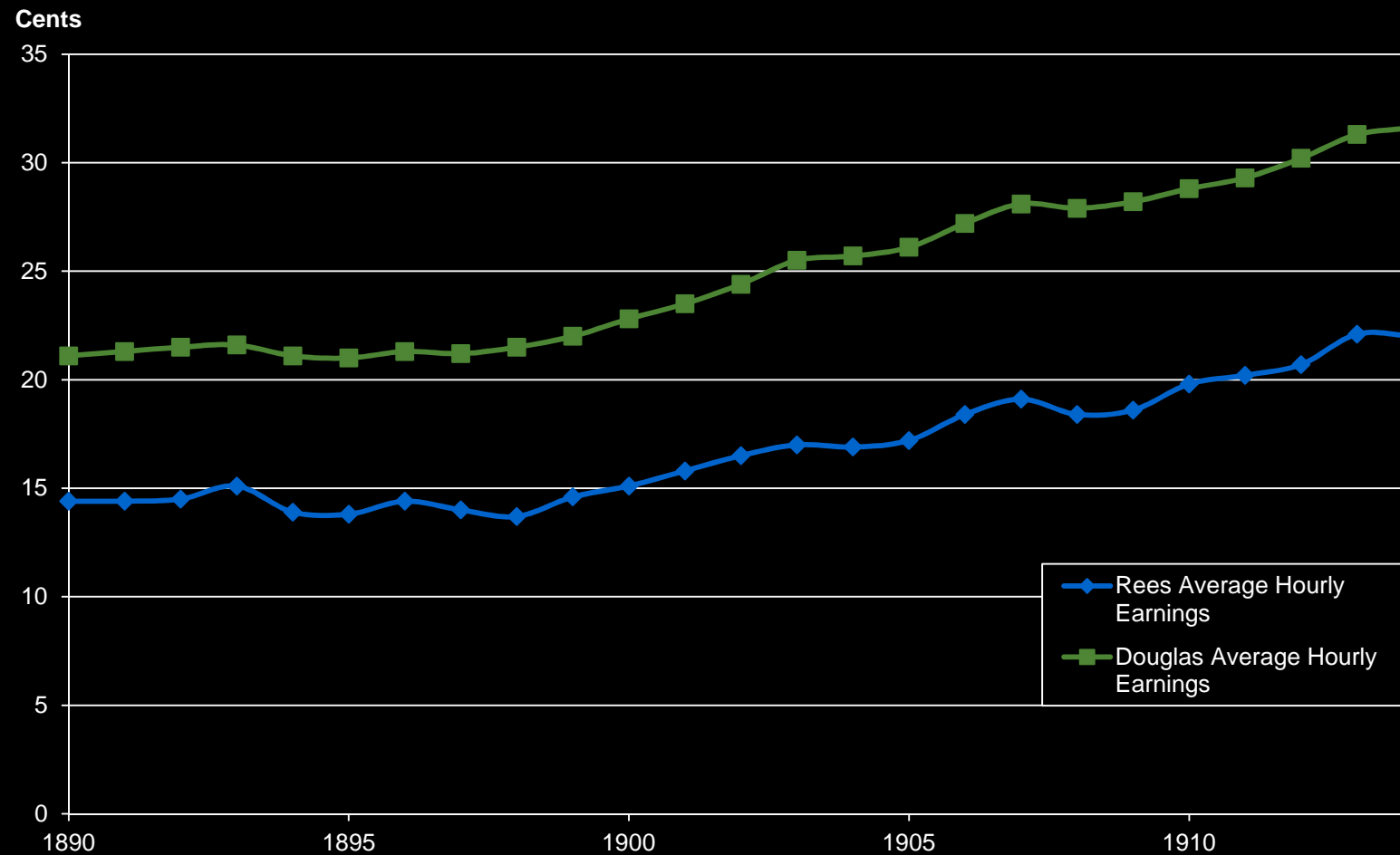|	English Price/Chinese Price	English Budget Shares	Chinese Budget Shares
Starch	4.79	0.48	0.6
Meat	1.66	0.13	0.05
Milk	0.89	0.13	0.01
Tea	26.6	0.03	0.05
Sugar	15.24	0.04	0.12
Charcoal	0.19	0.04	0.02
Lighting	1.96	0.05	0.03
Cotton Cloth	3.38	0.05	0.08
Iron Work	3.12	0.02	0.02
Nails	1.45	0.02	0.02
CPI		3	4.91
Wage Rate	3.67	3.67	3.67
Real Wage		1.22	0.75

Cents

FIGURE 1: AVERAGE HOURLY EARNING IN CENTS, 1890-1914

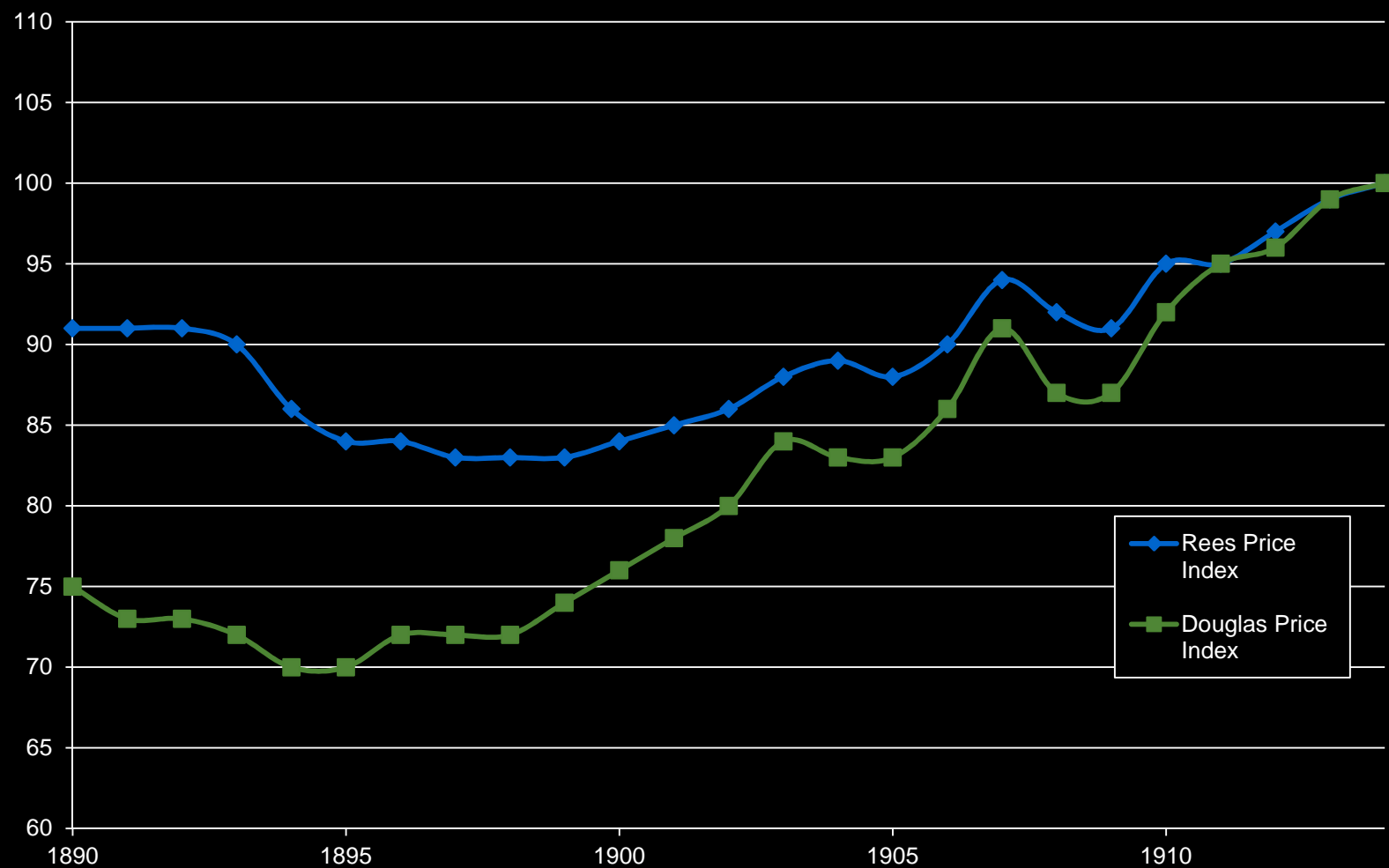*Source*: Douglas (1930), Rees (1962)

FIGURE 2: CONSUMER PRICE INDEXES, 1890-1914 (1914=100)

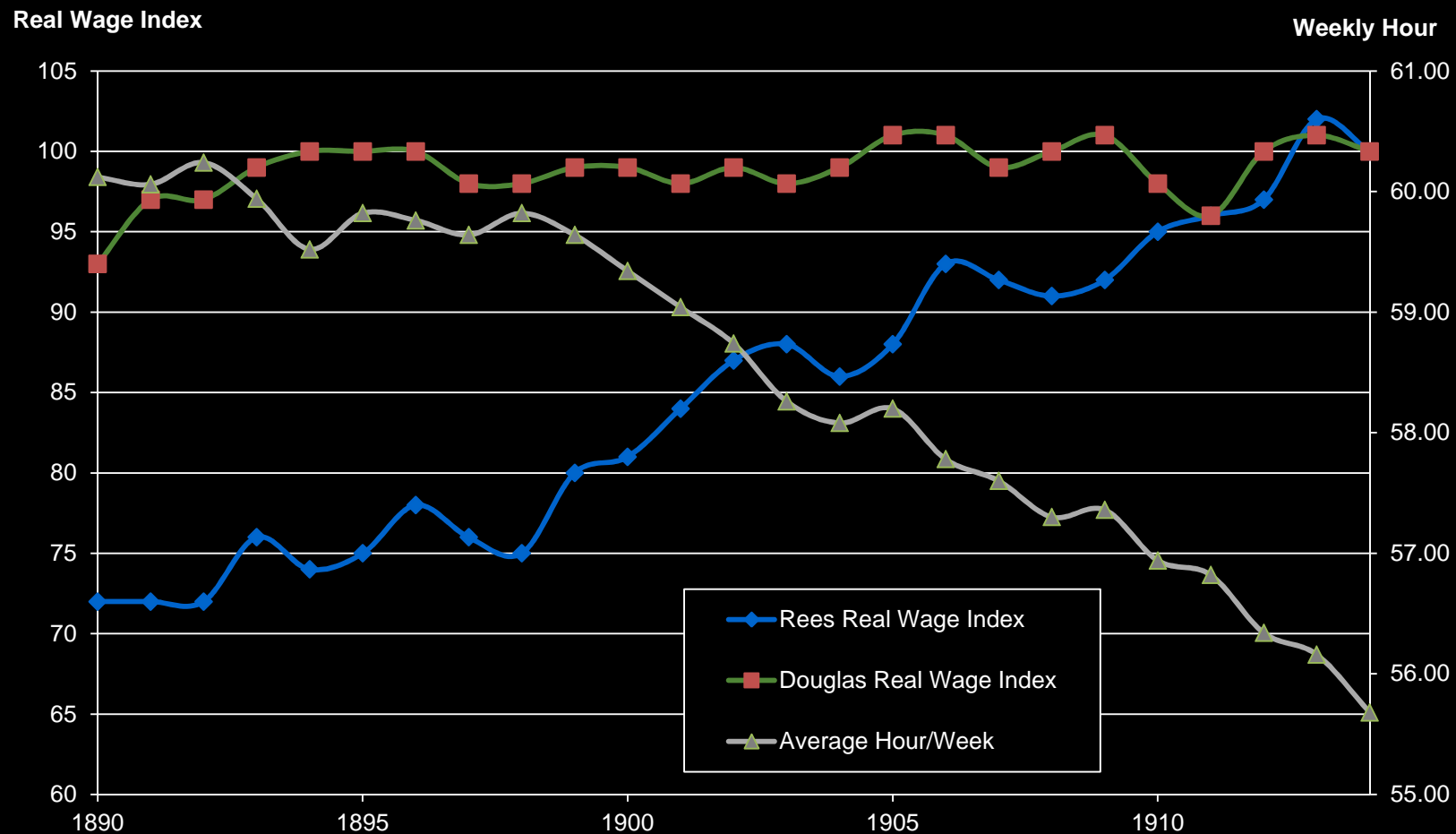*Source*: Douglas (1930), Rees (1962)

FIGURE 3: REAL WAGE INDEXES AND WEEKLY HOURS WORKED, 1890-1914 (1914=100)

Source: Douglas (1930), Rees (1962)

TABLE 2: REAL WAGE RATES IN VARIOUS PARTS OF THE WORLD, 1900-1914

	Wage Relative to "Barebones Subsistence" Cost (1900-1914)
Japan	1.36
Canton	1.01
Beijing	1.39
Delhi	1.43
Florence	1.8
Bengal	1.51
London	7.49
Oxford	6.06
Amsterdam	5.07
Mexico City	1.51
Bogota	1.33
Chicago	6.08

Interpreting Real Wage Measures: A Constant Utility Index

The solution of the indirect utility function v(w,p,y) for w*=w*(p,y,v*) provides the basis for a constant-utility index number of real wages. Pencavel (1977)

A comparison of the observed w with w* indicates whether the worker's real wage has increased. w/w* is thus a real wage index from the worker's point of view. It decreases with increased prices and non-work income.
The interpretation is not affected by market distortions or wage regulation.

The Real Wage as Marginal Product of Labor

- Assuming workers are paid the marginal product of their labor, real wage rates for comparable workers can be used to control for skill differences (**h_i**) and measure Total Factor Productivity (**A_i**). Hall and Jones (1999) write (Cobb-Douglas) production as

$$Y_i/L_i = y_i = (K_i/Y_i)^{\alpha/(1-\alpha)}A_ih_i$$

  Selecting h_{0i} identically in each location , and **ASSUMING that wages are not distorted by regulation** implies that

- $w_{0i}/w_{00} = [A_i (K_i/Y_i)^{\alpha/(1-\alpha)}]/A_0 (K_0/Y_0)^{\alpha/(1-\alpha)}$.

- Relative wages adjusted for capital/output ratios measure relative TFP.

Prices with Tradable and Non-Tradable Goods

If a quasi-tradable good is produced with (Cobb-Douglas) technology using non-tradable labor paid wage w_{0i} , and if the tradable good is priced p, then

$$p_{ni}=w_{0i}^{a}p^{1-a},$$

describes the price of the quasi-tradable good (p_n) as a concave function of the local wage, where a is the share of the non-tradable in total cost.

A real wage defined as

$$w_{0i}/p_{ni}=(w_{0i}/p)^{1-a},$$

Is a purchasing-power-parity adjusted wage where the weights in the puchasing power basket are a and 1-a, and it is concave function of the real wage measured in tradables.

MCDONALDS AT BASANT LOK
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6147219/6149662
THANKS FOR COMING
* IMPLIES FROZEN DESSERT

21-JUL-00   11:45 REG 3 RCT92 ST   10

HIGH ORDER RECEIPT

QTY	ITEM	EACH	TOTAL
		59.00	59.00
1	VEGCCM	52.00	52.00
1	MAHMAC	31.00	31.00
	MSHCH*	20.00	20.0
	MDCOKE		

EAT-IN TOTAL   INCL TAX   162.00

CASH TEND   500.00
CHANGE   338.00

T 1   142.00 RATE 8.0000% INCL   10.54
T 2   20.00 RATE 15.0000% INCL   2.61

Why McWages?

Focus on entry-level basic-crew job at McDonald's because these are virtually identical jobs in terms of

- labor input
- hedonic job qualities
- producing identical product with identical technology

- Operations are monitored using the 600-page <u>Operations and Training Manual</u> (time tables, color photographs) –in over 140 countries.

- Over 90% of McWorkers are hourly paid Crew & Training Squad workers rotating through stations / sales counter.

- Ingredients delivered frozen and handled in a mechanized system that differs little place to place. FOOD SAFETY IS CRITICAL and a key to marketing in poor countries.

- McDs, do not adjust technology to different wages

Data collection

- In total, we have data for 64 countries from 2007, but for fewer countries back to 2000.

- Hourly wages of Crew and Training Squad

- Data from large urban areas (2 cities in 2007, 2 restaurants per city, where available). Correlation of median and average wages is 0.9999.

- Price of Big Mac (BMI)

- Reliability?
  - We collected several McWages ourselves as a check (in Canada, Czech Rep., Denmark, India, Italy) – the main data is fully consistent with our own measurements.
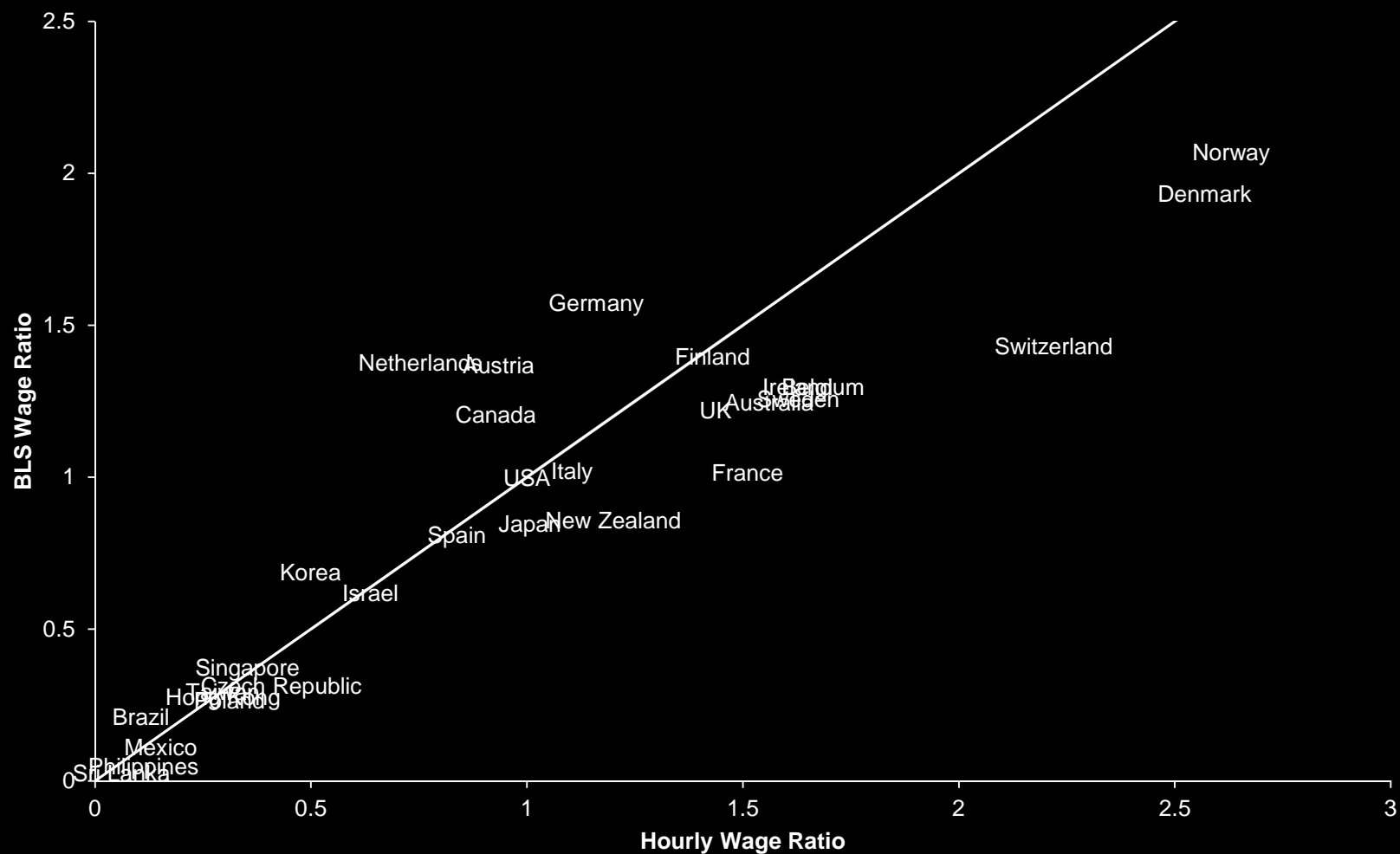 - Big Mac price correlates with the Economist (0.99)

FIGURE 4: THE McWAGE COMPARED TO BLS WAGE ESTIMATES, 30 COUNTRIES, 2007

Note: The McWage and the BLS wage estimates are each expressed relative to the US level, and displayed with a 45 degree line. This implies that the US is at the point 1,1.

Source: Authors calculations, BLS < ftp://ftp.bls.gov/pub/special.requests/ForeignLabor/>
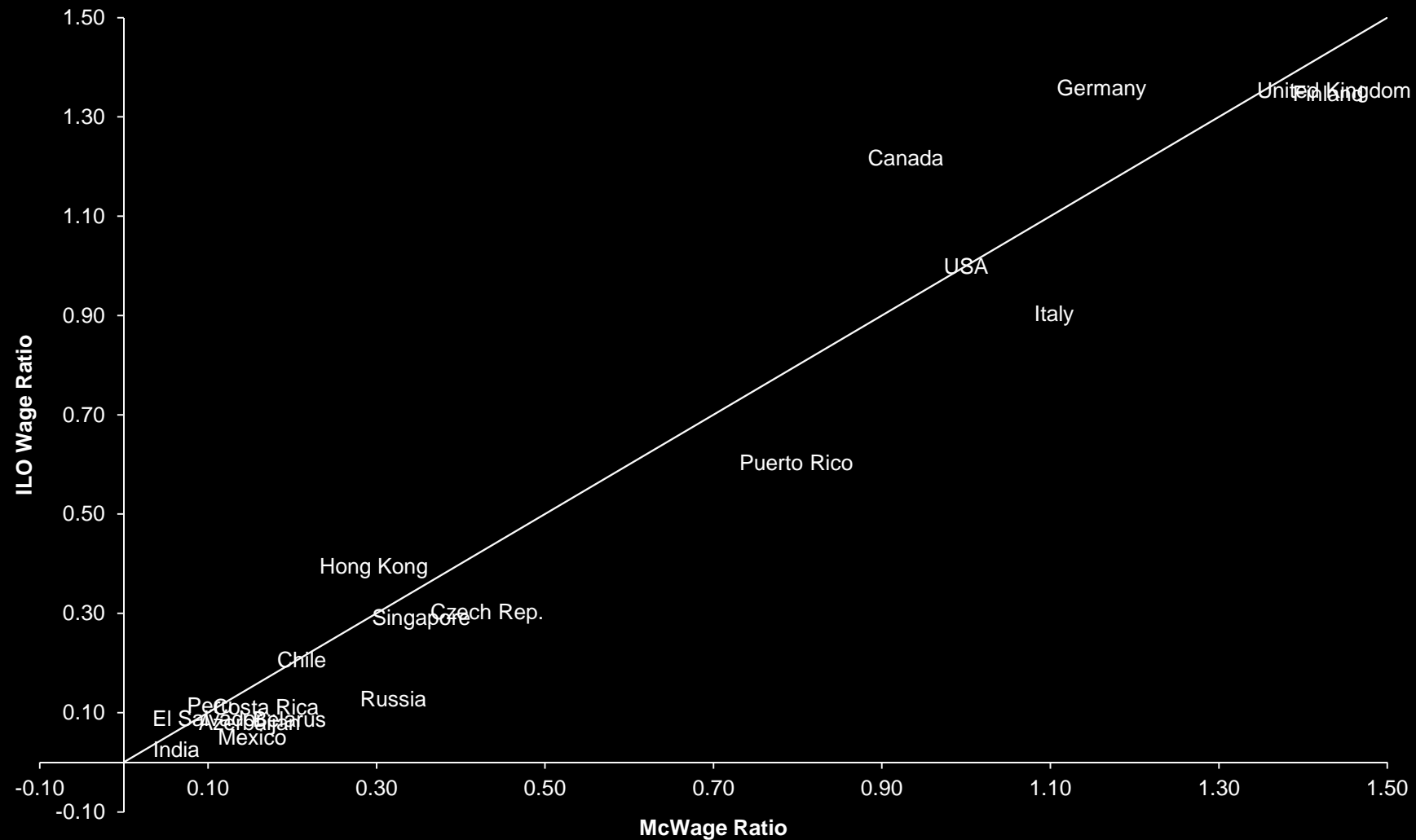
FIGURE 5: THE McWAGE COMPARED TO ILO WAGE ESTIMATES, 19 COUNTRIES, 2007

Note: The McWage and the ILO wages are each expressed relative to the US level, and displayed with a 45 degree line.
Denmark has a McWage ratio of 2.57 and an ILO wage ratio of 3.13, off the dimensions of the chart.

Source: Authors calculations, http://laborsta.ilo.org/ (The ILO October Inquiry).
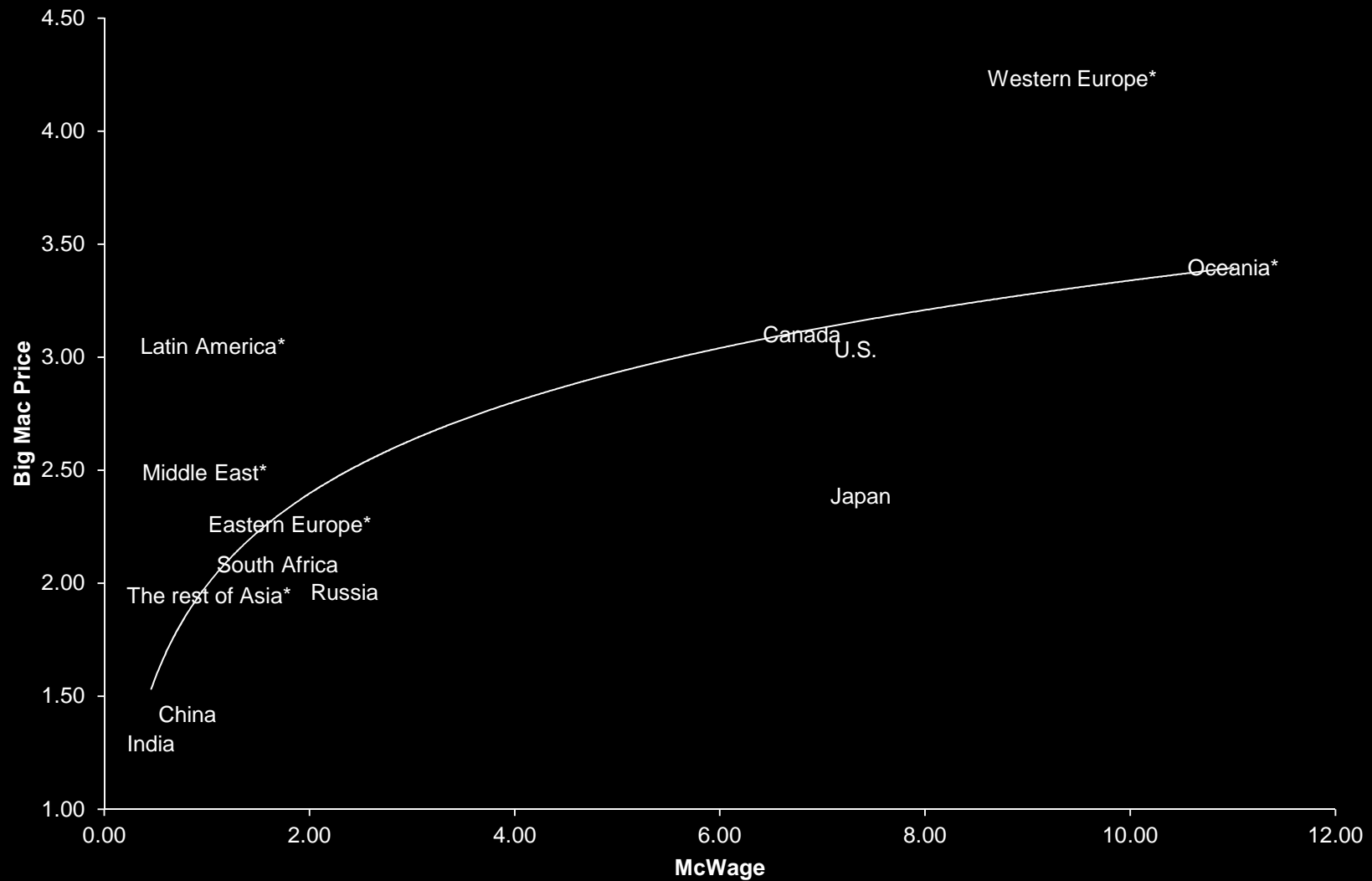
FIGURE 8: BIG MAC PRICE COMPARED TO THE McWAGE, 2007

Note: See Note to Table 3. The regression line is from a log linear regression with slope .586.
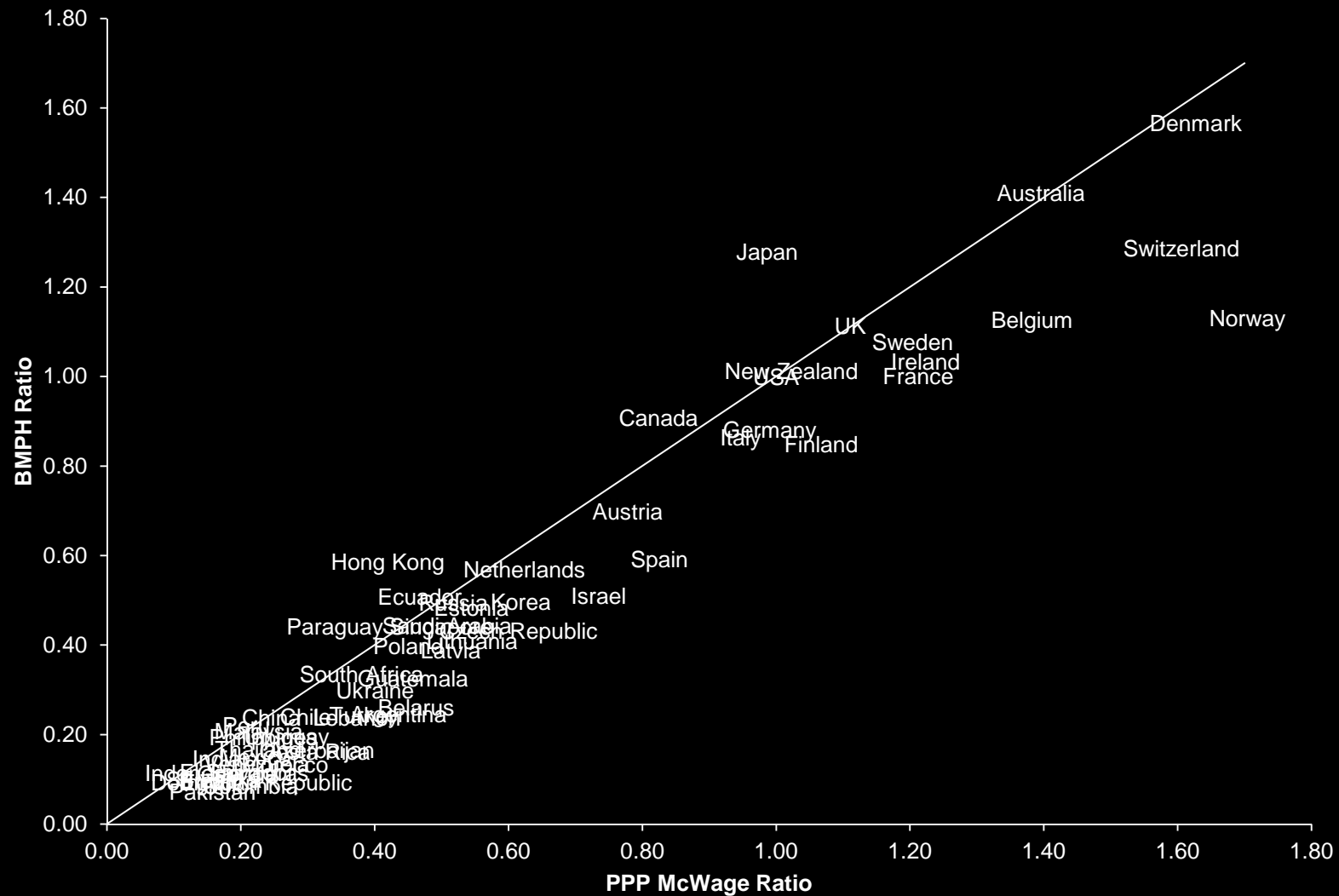
Source: Authors Calculation

FIGURE 6: THE McWAGE ADJUSTED FOR PURCHASING POWER PARITY PRICES COMPARED TO BIG MACS PER HOUR OF WORK (BMPH), 62 COUNTRIES, 2007

Note: The McWage is adjusted for purchasing power price prices in 2005, the latest year available. The PPP adjusted McWage and Big Macs Per Hour are each expressed relative to the US level, and displayed with a 45 degree line.

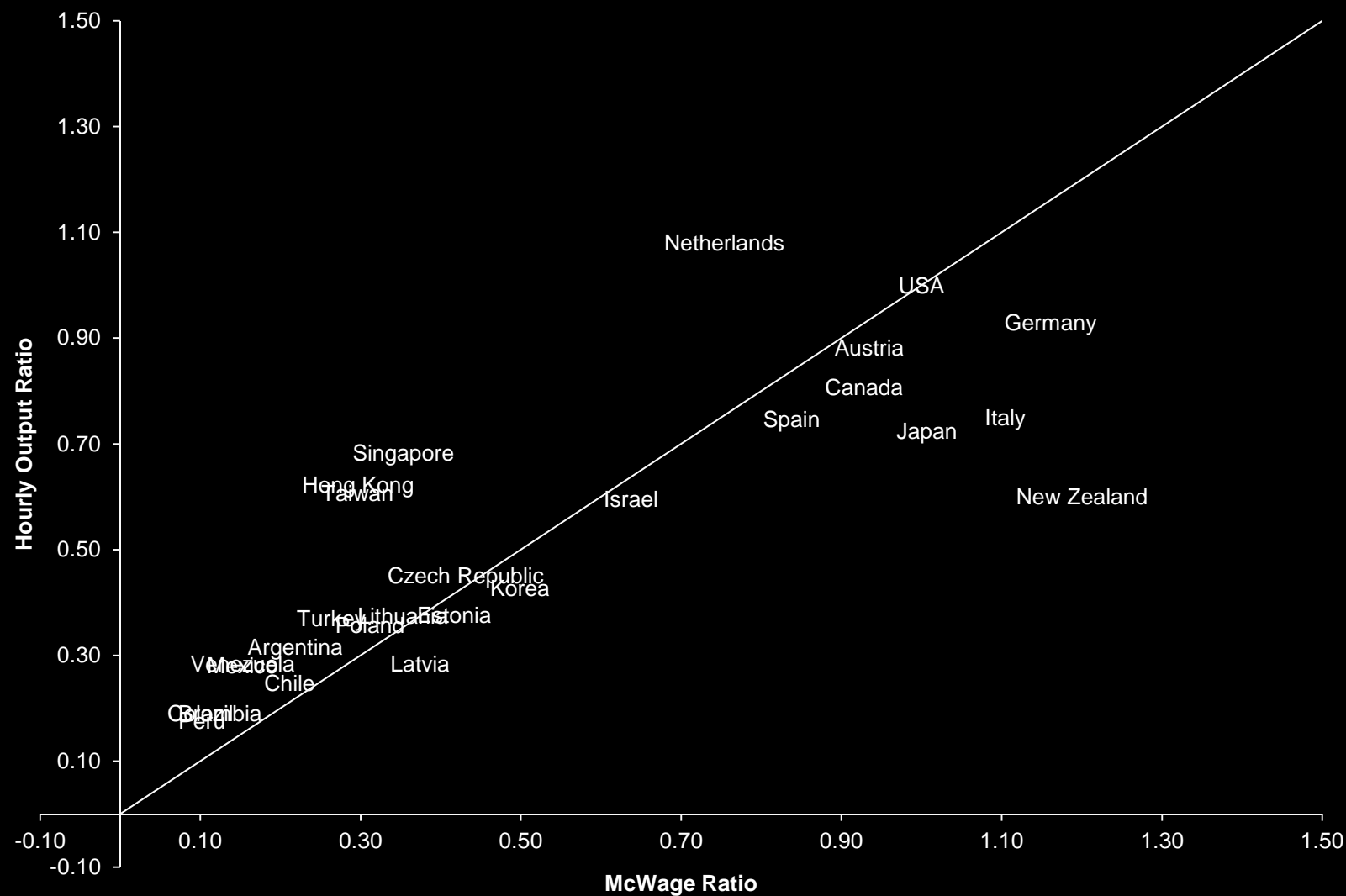*Source:* Authors calculations, Penn World Table <http://pwt.econ.upenn.edu/ php_site/ pwt70/ pwt70 _form. php>

FIGURE 7: THE McWAGE COMPARED TO OUTPUT PER MANHOUR, 27 COUNTRIES, 2007

Note: The McWage and output per man hour are each expressed relative to the US level, and displayed with a 45 degree line.

Source: Authors calculations, Penn World Table <http://pwt.econ.upenn.edu/ php_site/ pwt70/ pwt70 _form. php>
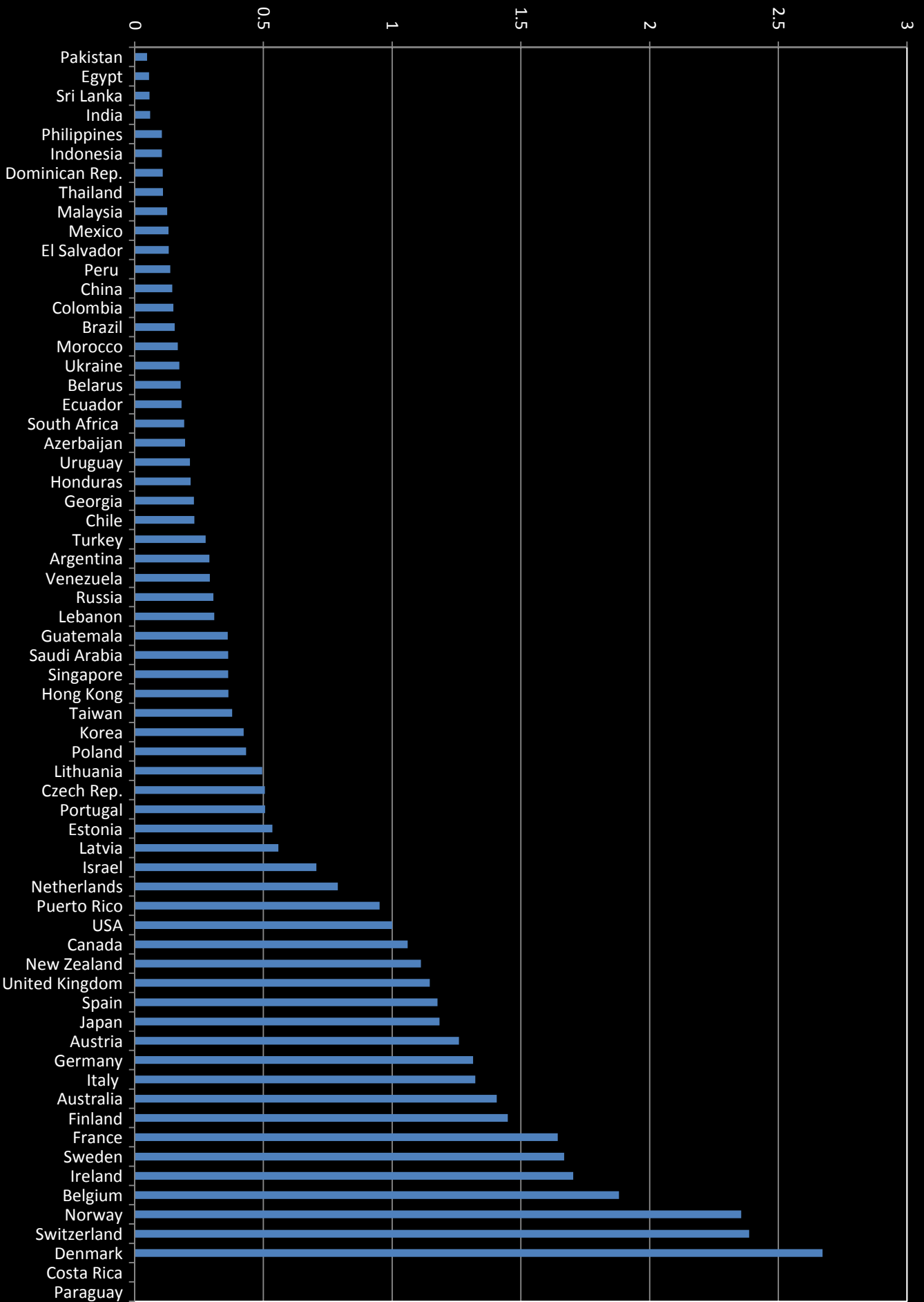
McWages in 2009, relative to US level

Country	Value
Pakistan	
Egypt	
Sri Lanka	
India	
Philippines	
Indonesia	
Dominican Rep.	
Thailand	
Malaysia	
Mexico	
El Salvador	
Peru	
China	
Colombia	
Brazil	
Morocco	
Ukraine	
Belarus	
Ecuador	
South Africa	
Azerbaijan	
Uruguay	
Honduras	
Georgia	
Chile	
Turkey	
Argentina	
Venezuela	
Russia	
Lebanon	
Guatemala	
Saudi Arabia	
Singapore	
Hong Kong	
Taiwan	
Korea	
Poland	
Lithuania	
Czech Rep.	
Portugal	
Estonia	
Latvia	
Israel	
Netherlands	
Puerto Rico	
USA	
Canada	
New Zealand	
United Kingdom	
Spain	
Japan	
Austria	
Germany	
Italy	
Australia	
Finland	
France	
Sweden	
Ireland	
Belgium	
Norway	
Switzerland	
Denmark	
Costa Rica	
Paraguay	

TABLE 3: McWAGES, BIG MAC PRICES AND BIG MACS PER HOUR OF WORK (BMPH), 2007

Countries and Economic Regions	McWage	McWage Ratio	Big Mac Price	BMPH
U.S.	7.33	1	3.04	2.41
Canada	6.8	0.93	3.1	2.19
Russia	2.34	0.32	1.96	1.19
South Africa	1.69	0.23	2.08	0.81
China	0.81	0.11	1.42	0.57
India	0.46	0.06	1.29	0.35
Japan	7.37	1.01	2.39	3.09
U.K.	10.53	1.44	3.92	2.69
The rest of Asia*	1.02	0.14	1.95	0.53
Eastern Europe*	1.81	0.25	2.26	0.8
Western Europe*	9.44	1.29	4.23	2.23
Middle East*	0.98	0.13	2.49	0.39
Latin America*	1.06	0.14	3.05	0.35

TABLE 4 COMPARING HYPOTHETICAL MEASURES OF TOTAL FACTOR PRODUCTIVITY, 2007

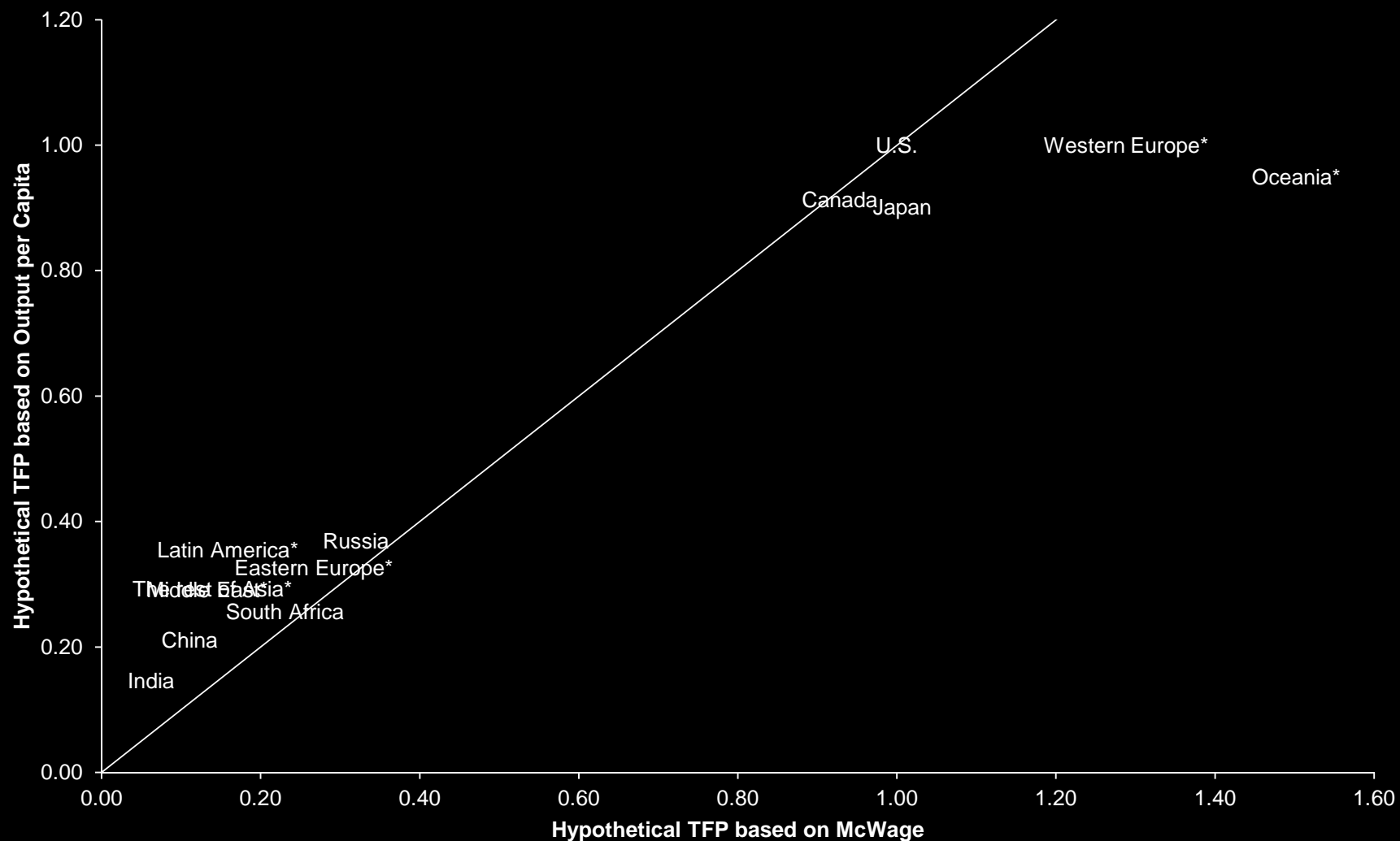| Economic Region	Hypothetical TFP Based on Output/Capita	Hypothetical TFP Based on McWage
U.S.	1.00	1.00
Canada	0.91	0.93
Russia	0.37	0.32
South Africa	0.26	0.23
China	0.21	0.11
India	0.15	0.06
Japan	0.90	1.01
The rest of Asia*	0.29	0.14
Eastern Europe*	0.33	0.27
Western Europe*	1.00	1.29
Middle East*	0.29	0.13
Latin America*	0.36	0.16
Oceania*	0.95	1.50

FIGURE 9: COMPARISON OF HYPOTHETICAL TOTAL FACTOR PRODUCTIVITY
MEASURED WITH OUTPUT/WORKER AND McWAGES, 2007

Note: see Note to Table 4. Both TFP measures are expressed relative to the US level, and displayed with a 45 degree line.

Source: see Source of Table 4

TABLE 5: GROWTH IN McWAGES, BIG MAC PRICES AND BIG MACS PER HOUR OF WORK (BMPH), 2000-2007

	McWage Ratio	McWage Ratio Relative to the U.S	Big Mac Price Ratio	BMPH Ratio
U.S.	1.13	1	1.21	0.93
Canada	1.51	1.34	1.66	0.91
Russia	4.63	4.11	1.84	2.52
China	1.92	1.71	1.2	1.6
India	1.57	1.4	1.03	1.53
Japan	0.95	0.85	0.94	1.02
U.K.	1.51	1.33	1.30	1.16
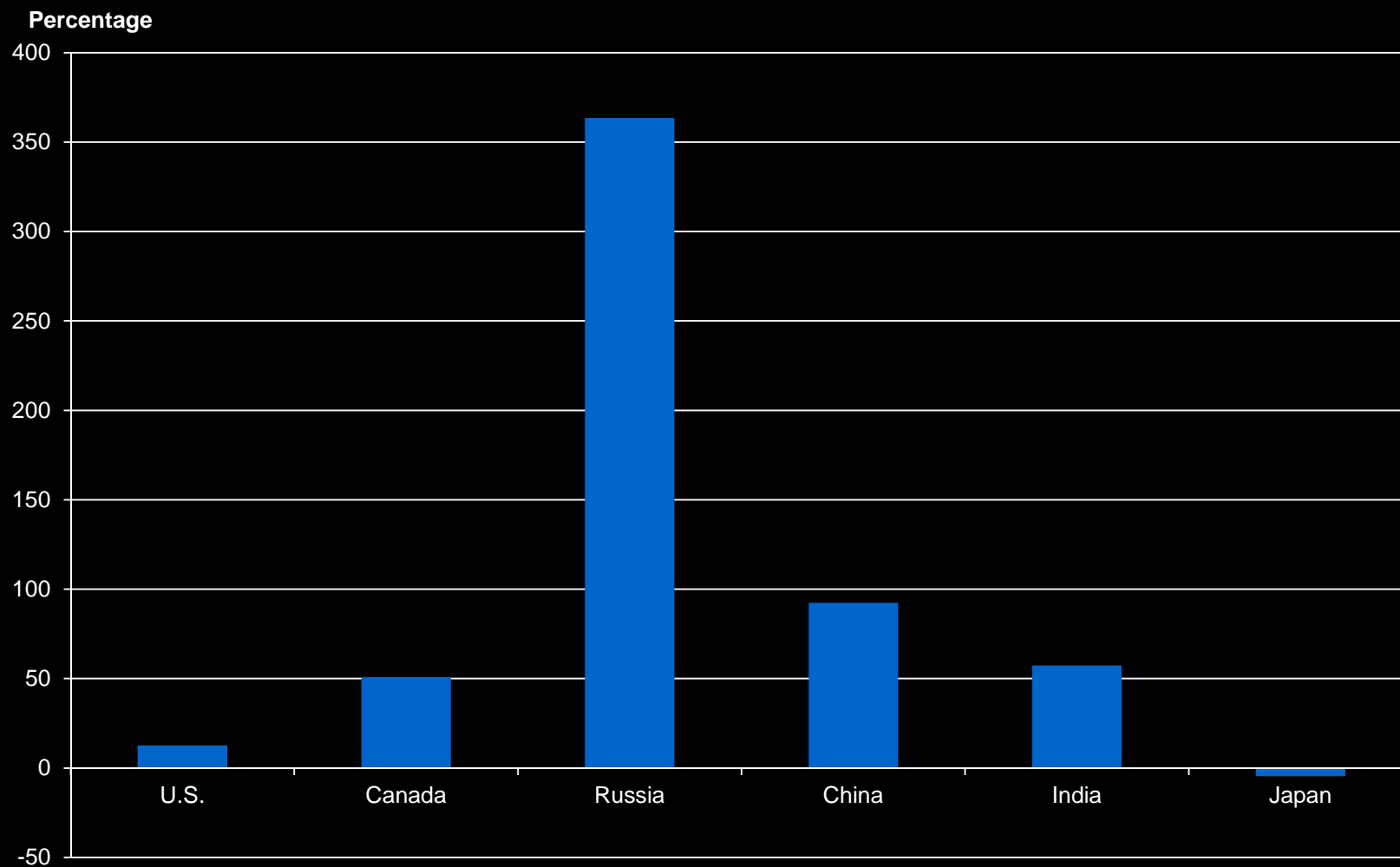
FIGURE 10: PERCENTAGE GROWTH IN McWAGES, 2000-2007

Note: See Note to Table 5

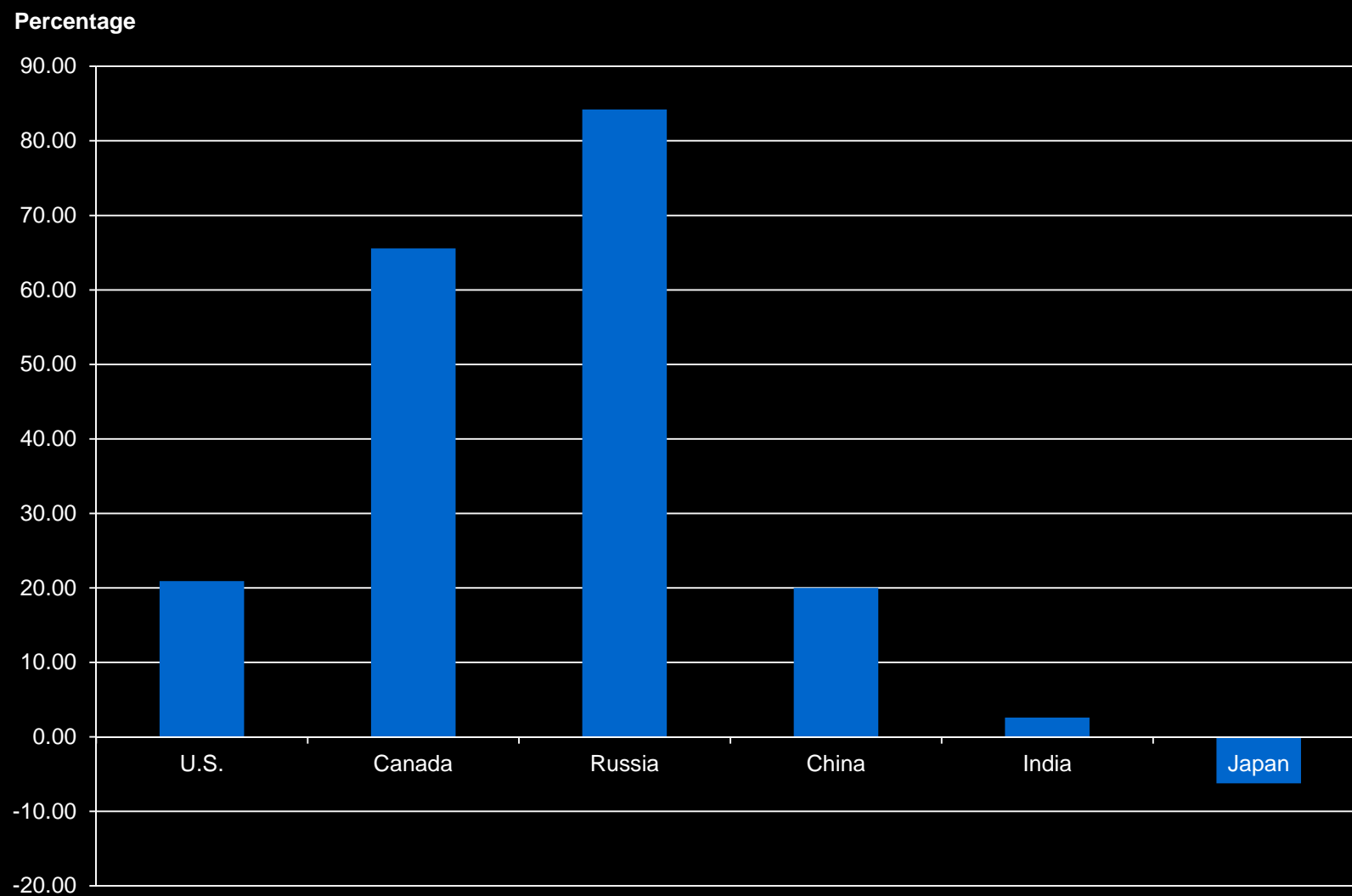*Source:* Authors Calculation

Percentage

FIGURE 11: PERCENTAGE GROWTH IN BIG MAC PRICES, 2000-2007

Note: See Note to Table 5
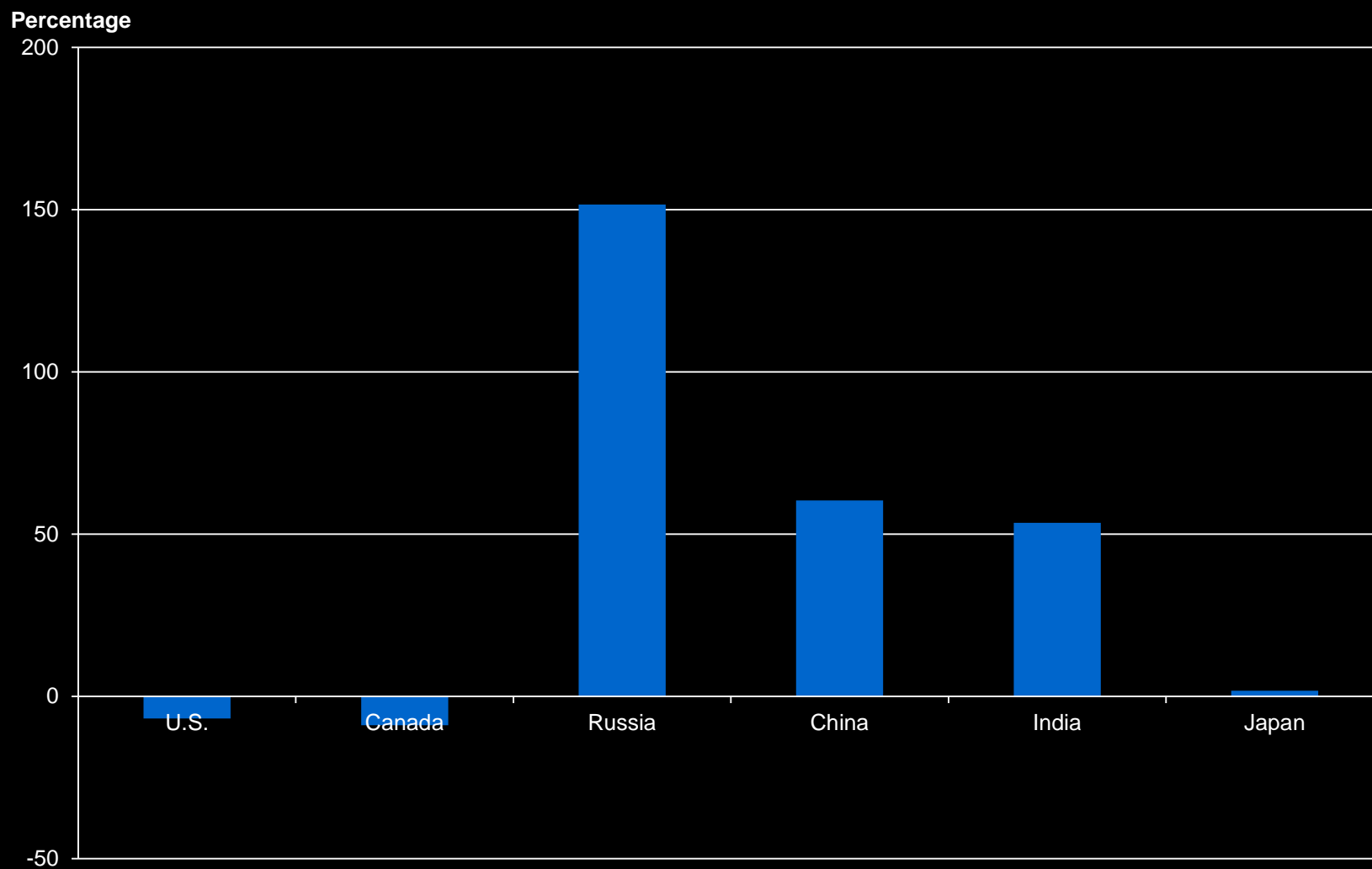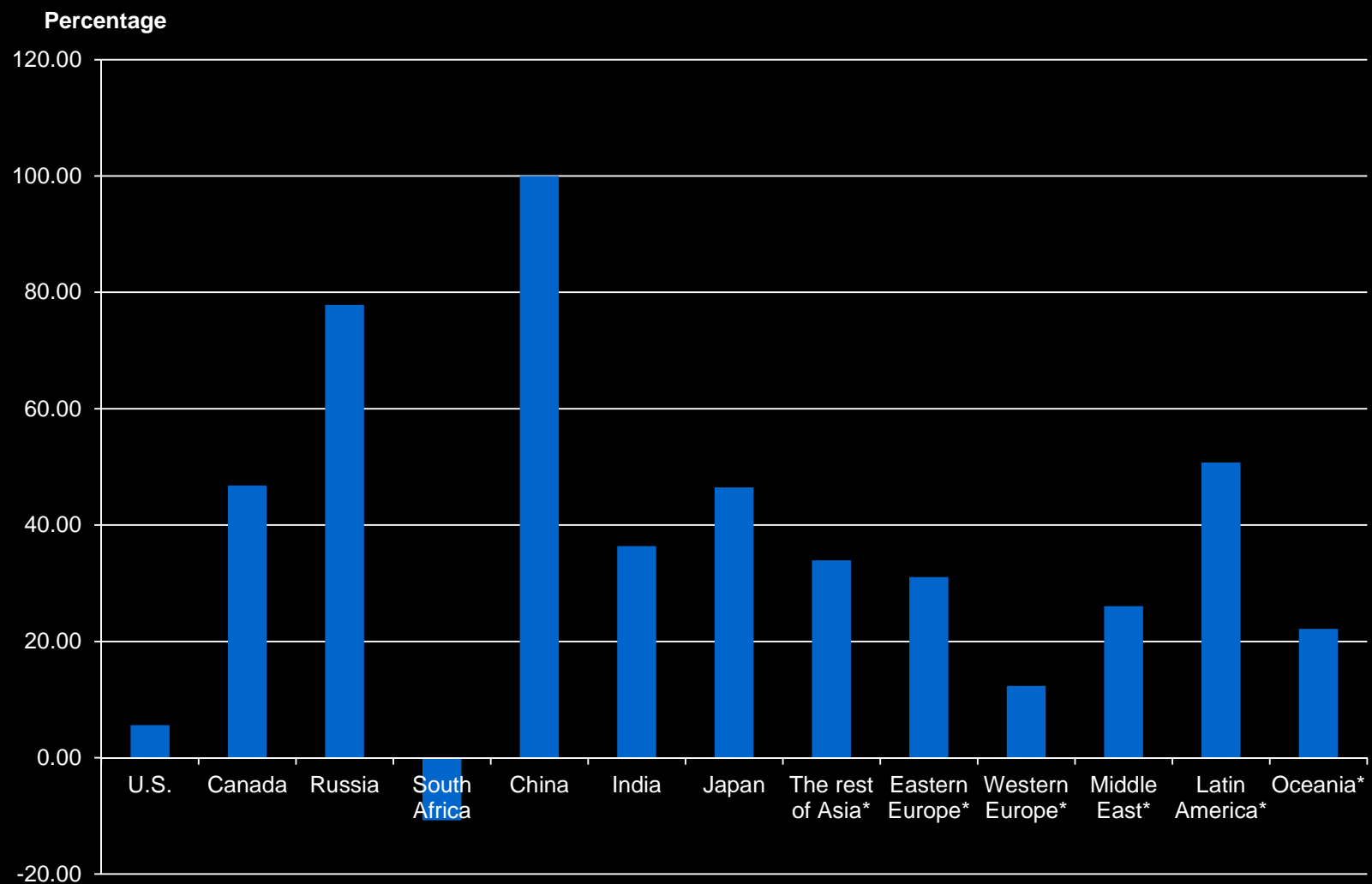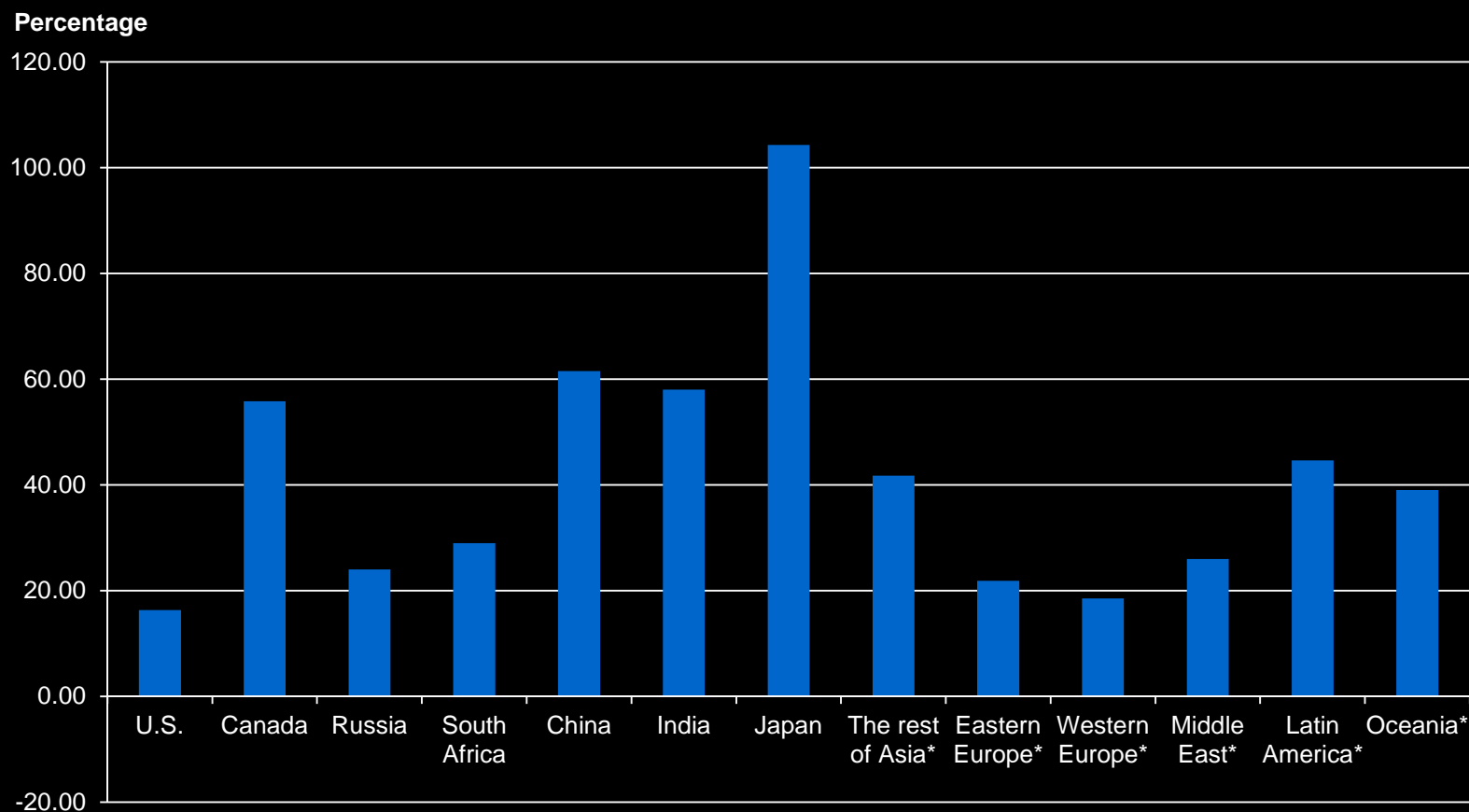
Source: Authors Calculation

FIGURE 12: PERCENTAGE GROWTH IN BIG MACS PER HOUR OF WORK, 2000-2007

Note: See Note to Table 5

Source: Authors Calculation

TABLE 6: GROWTH IN McWAGES, BIG MAC PRICES AND BIG MACS PER HOUR OF WORK (BMPH), 2007-2011

	McWage Ratio	Big Mac Price Ratio	BMPH Ratio
U.S.	1.06	1.16	0.91
Canada	1.47	1.56	0.94
Russia	1.78	1.24	1.43
South Africa	0.89	1.29	0.69
China	2.00	1.62	1.24
India	1.36	1.58	0.86
Japan	1.46	2.04	0.72
U.K.	0.86	0.99	0.87
The rest of Asia*	1.34	1.42	0.94
Eastern Europe*	1.31	1.22	1.08
Western Europe*	1.12	1.19	0.95
Middle East*	1.26	1.26	1.00
Latin America*	1.51	1.45	1.04
Oceania*	1.22	1.39	0.88

FIGURE 13: PERCENTAGE GROWTH IN McWAGES, 2007-2011

Note: See Note to Table 6

Source: Authors Calculation

FIGURE 14: PERCENTAGE GROWTH IN BIG MAC PRICES, 2007-2011
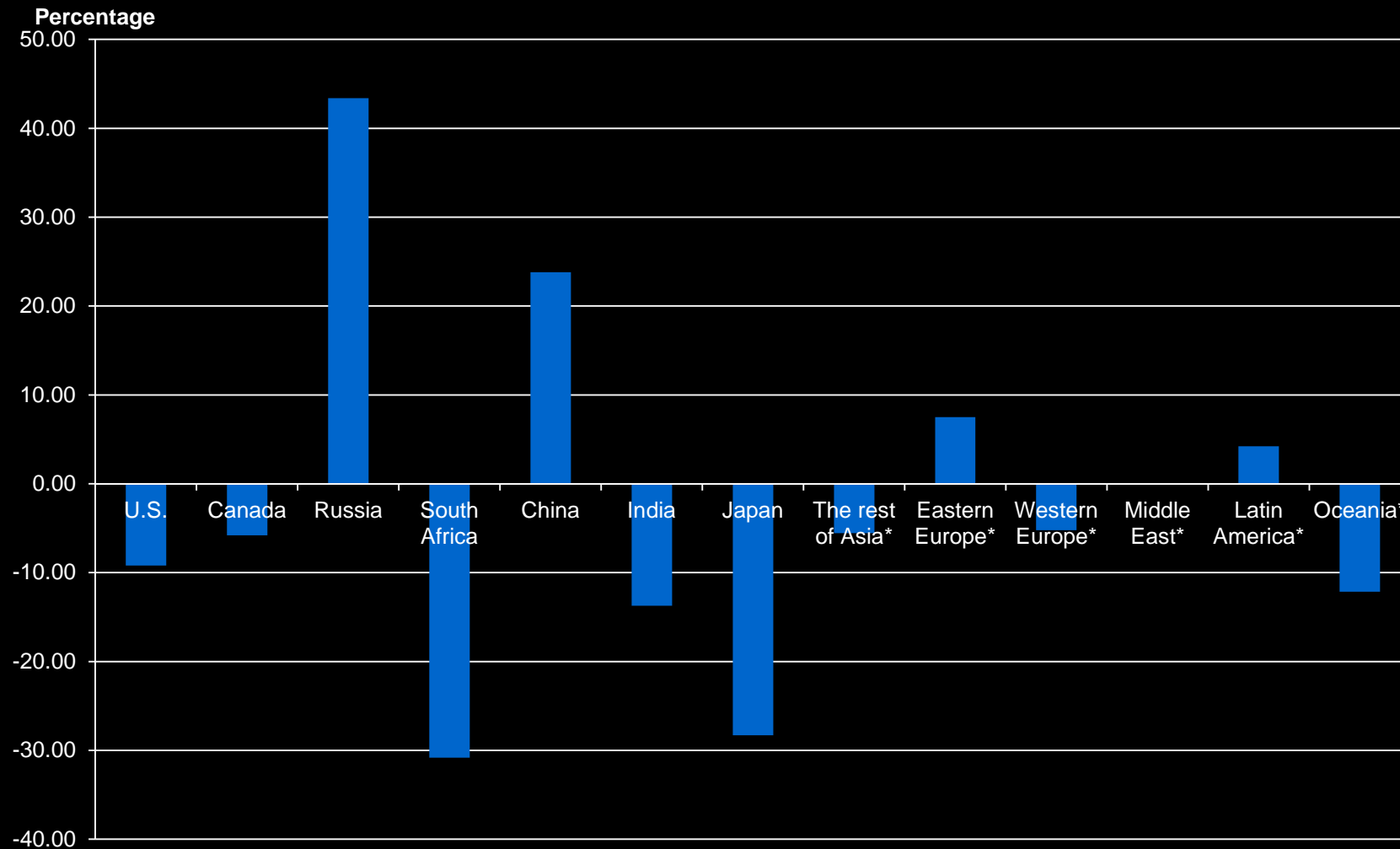
Note: See Note to Table 6

Source: Authors Calculation

Percentage

FIGURE 15: PERCENTAGE GROWTH IN BIG MACS PER HOUR OF WORK, 2007-2011

Note: See Note to Table 6

Source: Authors Calculation