Appendix:

The Race Between Demand and Supply: Tinbergen's Pioneering Studies of Earnings Inequality*

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Contents

Outline

(1) Tinbergen was a versatile, wide-ranging economist who thought broadly and deeply and wrote accordingly.

(2) He is best known for his pioneering work on business cycle models and macroeconometrics—but this was only an aspect of his research on inequality.

(3) He had an enduring interest in inequality in society (Tinbergen, 1956, 1975). A retrospective emphasized this. See Kol and Wolff (1993).

(4) This interest was part of his vision of central planning and optimal design of societies, which emerged from his deep concern about the poverty and inequality rampant within and across countries in the Great Depression (Tinbergen, 1952).

(5) Tinbergen was fundamentally an economic scientist – he integrated theory and data in his work.

(6) Tinbergen was a creative force. He pioneered:

   (a) The integration of supply and demand of vectors of productive attributes in the study of inequality. Examined both broadly and specifically the role of institutions and markets.

   (b) Pioneered hedonics; the study of the pricing of vectors of quality attributes in labor markets.

(c) Shaped the modern discussion of the race between supply and demand (the race between education and technology) that has been updated and revised by Katz and Murphy (1992); Lee and Wolpin (2006); Goldin and Katz (2008); Acemoglu and Autor (2011).

(7) Contributions:

(a) Integrated the analysis of demand and supply in labor markets.

(b) Disaggregated the components of income determination beyond an amorphous scalar "human capital:"

(i) Noncognitive skills; abilities (persistence)

(ii) Demand elements;

(iii) Educational planning;

(iv) Compensating differences and supply.

(8) Why was his work neglected?

(a) Political element. The idea of an optimum plan and social planning was not well-regarded, especially among the early proponents of the human capital school.

(b) Same with Bowles-Gintis and development planning approach.

(c) Chicago emphasized a supply-side approach (Schultz, demand unstable; supply stable).

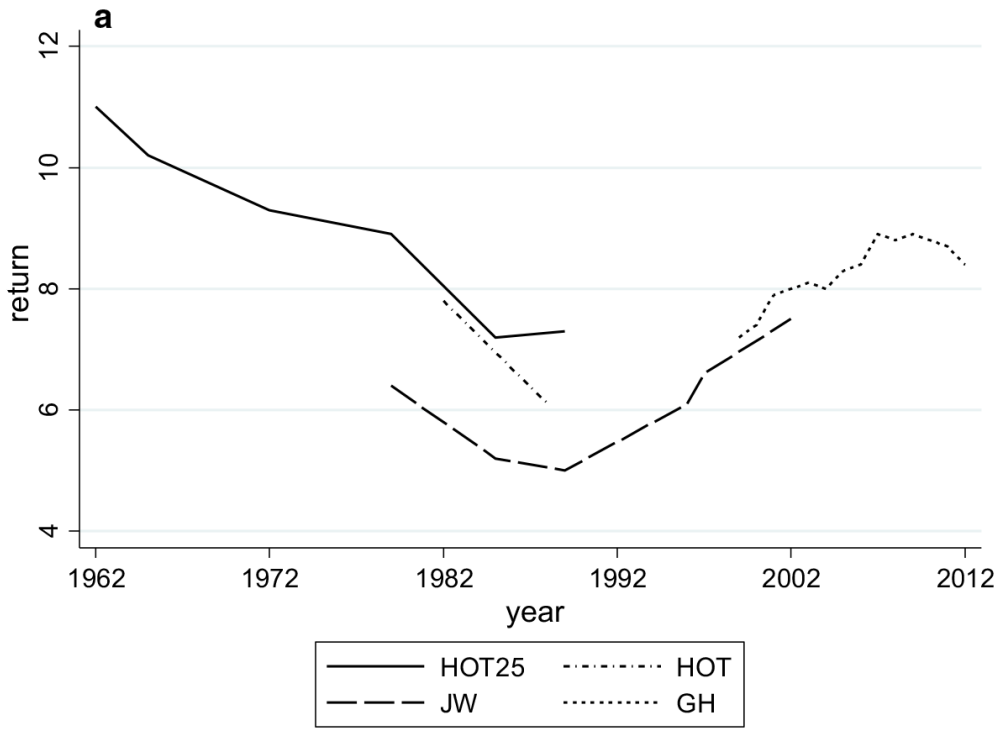
A-1 The Data

In the Netherlands, until recently, the supply side was winning and the returns to education were declining or stagnant. The exact reasons for this phenomenon are not well understood. Recently, however, there is evidence that suggests that the returns to schooling are increasing and that demand is outstripping supply, as it has done in most developed countries around the world. This has produced rising wage inequality. Unless more active supply side measures are undertaken, this trend is likely to continue. This problem, joined with the persistent problem of immigrant assimilation and the growing role of immigrants in the Dutch economy, renews interest in the supply side of the labor market.

He wrote about the race between technological change and education, a theme that motivated much later research. A major contribution of that work was to unite supply-oriented human capital theory with the demand-oriented educational planning approach to bring both supply and demand factors into the foreground in analyzing the determination of labor income. Tinbergen presented a coherent static general equilibrium approach within which it was possible to analyze policies and compute welfare. He considered optimal tax and subsidy policies, including tuition policy. At the time Tinbergen was writing, supply was beating demand in the Netherlands and in most of the rest of the developed world. **[JJH: Linor, Kurtis, and Meera, is this still true?] [Typist: See the paper "Mismatch between education and the labour market in the Netherlands: is it**

a reality or a myth? The employers' perspective" printed and on the key] [Typist: REPRINTED] The return to schooling was high but falling (see Figures 1 and 2). The figures reveal that unlike many countries around the world in the 1980s and early 1990s, Holland did not experience a rise in the return to schooling. Educational attainment rates in higher education were low but rising (see Table 1). Figure 3 reveals that university enrollment rates were rising continuously over most of the post-World War II period. Although international comparisons of educational attainment are difficult given substantial differences in schooling systems during this period, the Dutch rate was comparable or superior to rates in many other European countries. In participation in primary and secondary education, Holland was ahead of most countries (see Table 2). Counting advanced vocational training as a form of postsecondary schooling, the Netherlands has a high rate of post-secondary attendance.

Figure A-1: Mincer returns to schooling: Men

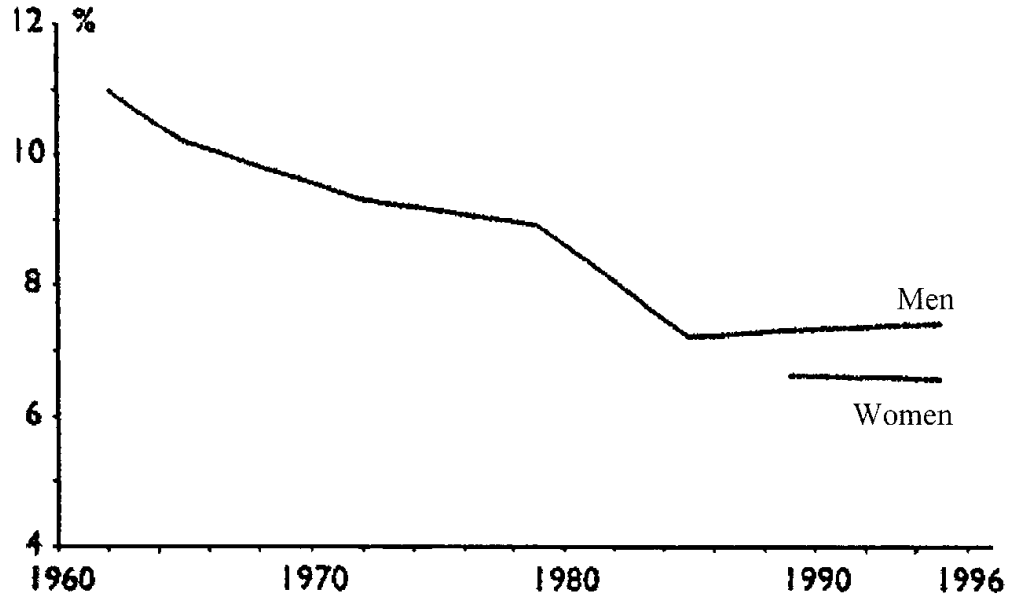


Source: Hartog and Gerritsen (2016)

Figure A-1: Mincer returns to schooling: Women

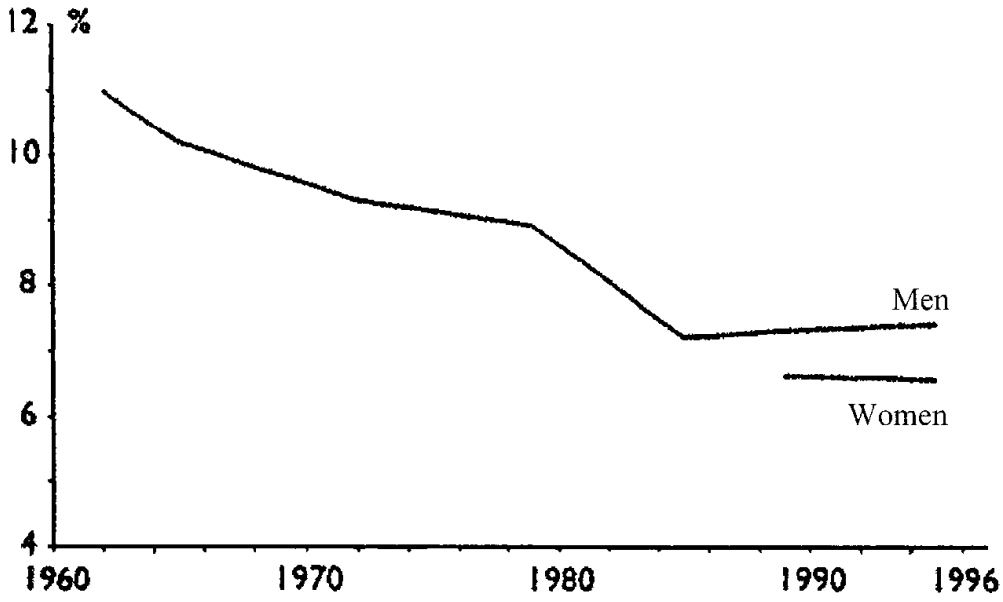
Source: Hartog and Gerritsen (2016)

Figure A-2: Returns to Schooling to Hourly Wages



Source: CBS loonstructuuronderzoeken 1962, 1965, 1972, 1979, 1985, 1989 and 1995
[JJH: Meera and Kurtis, update]

Figure A-3: Returns to Schooling to Net Hourly Wages



Source: OSA-panel; Hartog, Odink, and Smits
[JJH: Ditto]

The reasons for this increase in supply of skilled workers in the face of declining or stagnant real returns to schooling are still debated (see Hartog et al., 1999 and Oosterbeek and Webbink, 1995). Most Dutch scholars focus on family income as a major determinant of supply although its role in alleviating credit constraints and in financing consumption motives has not yet been However this issue is settled, it now seems moot. In the past 5-7 years, there is evidence that the return to schooling has begun to increase after a stagnant decade **[JJH: What has happened recently?] [Kurtis: Returns to education seem to have increased consistently from about 1990 to 2010, although since 2010 the returns seem to have begun to decrease again (see Hartog & Gerritsen (2016)] [JJH: Is this due to supply policies? Please clarify] [Kurt: Hartog & Gerritsen (2016) looks at Mincer Earnings Functions for the**

Netherlands from 1962-2012 to examine changes in return to education. They present their findings in the updated figures 1 and 2 (included in this Tinbergen paper) and interpret their results in the framework of Tinbergen's theory of the race between demand and supply. They explain the decrease in returns to education seen between 1962 and 1990 as being driven by "the growth of participation in higher education outpacing the growth in demand", while they explain the increase in returns to education seen between 1990 and 2010 as being driven by the technological revolution pushing the demand curve out faster than the supply curve. They don't explicitly address the recent decrease in returns to education (shown in their figures between 2010 and 2012), however, it seems their explanation is that in recent years supply has once again overtaken demand] [Typist: REPRINTED]. A recent paper by Jacobs (2004) presents suggestive calculations that Holland is experiencing the same skill-biased technical change that has been operating around the world since the late 1970s, and that demand is now outstripping supply here as it is elsewhere. This accounts for the evidence of Leuven and Oosterbeek (2000) presented in Table 3. Jacobs goes on to observe that tuition policy is an ineffective lever to pull in eliminating wage inequality by promoting supply. To close the wage gap by increasing the supply of skilled labor, tuition would have to be fully subsidized and students would have to be paid to go to school. His finding supports similar calculations for the US reported in Heckman and Lochner (2000) and Heckman (2000). The magnitude of the

subsidies to tuition needed to promote skills and reduce inequality are unacceptably large and would also generate massive deadweight unless they are selectively targeted. Accordingly, the tuition subsidy policies advocated by Dur and Teulings (2001) and others are likely to be costly and ineffective in reducing wage inequality.

A-2 Updated Tables 1 and 2 for Tinbergen's Race

Date: October 25, 2018

A-2.1 Notes about the Tables:

- Enrollment rate data by age is not publicly available for the years 1995-2005 (I have inquired at the OECD for this data, and am waiting for a response). Therefore, these tables only include recent data from 2005 onwards (2005, 2010-2016), as well as 1985 and 1995 data taken from the original draft.

- Table 1 includes ISCED Level 3 (Upper Secondary) enrollment and onwards for 18 to 24 year olds, but it is a straightforward adjustment if you need only Level 4 and onwards for this table.

- Table II includes ISCED Level 2 and Level 3 (Lower and Upper secondary) enrollment for 14-17 year olds (again, it would be a quick adjustment if you need enrollment rates for other levels of education and

age groups).

Table A-1: Participation in Higher Secondary Education, Ages 18-24: 1985-2016

Country	1985	1995	2005	2010	2011	2012	2013	2014	2015	2016	1985-95	1995-05	2005-16	1985-2016
Australia	.	23.9	28.8	32.2	33.2	33.7	34.2	35.3	41.3	41.4	.	4.9	12.7	.
Austria	.	14.7	.	27.9	28.6	29.3	29.8	29.4	29.3	29.1	.	.	.	.
Belgium	17.6	31	32.8	40.2	36.6	37.4	38.9	38.2	38.6	39	13.4	1.8	6.2	21.4
Canada	.	32.2	.	.	.	30.3	31.1	31.6	32.2	33.1	.	.	.	.
Czech Republic	.	13.3	.	.	.	.	30.9	31.5	31.1	30.4	.	.	.	.
Denmark	11.3	15.4	20.3	22.7	24.3	25.9	27.3	28.1	28.6	28.5	4.1	4.9	8.3	17.2
Finland	13.3	22.6	31.8	29.6	29.3	28.8	28.3	27.7	27.6	27.7	9.3	9.2	-4.1	14.4
France	15.9	28.1	29.6	31.3	32.1	33.3	34.4	35.4	36	37.1	12.2	1.5	7.4	21.2
Germany	11.9	13.9	16	17.7	19.4	17.8	22.9	24.2	24.9	24.8	2	2.1	8.8	12.9
Greece	.	23.7	.	.	.	.	.	41.4	43.6	45.3	.	.	.	.
Hungary	.	10.6	27.5	28.2	28.1	28.4	26.4	24.4	23.1	22.7	.	16.9	-4.9	.
Iceland	.	13.8	.	.	.	.	22.8	23.2	22.3	21.4	.	.	.	.
Ireland	.	21.3	.	.	.	.	33.7	34.9	36.7	37.2	.	.	.	.
Italy	.	.	.	.	.	.	24.1	23.7	23.7	27.6	.	.	.	.
Japan	.	.	.	.	.	.	.	43.9	.	.	.	.	.	.
Korea	.	27.4	51.5	58.3	58.9	58.3	57.6	56.4	55.4	54.4	.	24.1	2.9	.
Luxembourg	.	.	.	.	.	.	8.1	7.4	7.2	7.1	.	.	.	.
Mexico	.	7.3	13.7	16.1	16.9	17.4	18.3	18.7	19	21.1	.	6.4	7.4	.
Netherlands	13.7	22.3	.	32.3	33.2	33.7	33.9	35.3	37.3	37	8.6	.	.	23.3
New Zealand	.	21.1	30.7	32.7	32.9	33.1	31.4	33	32.9	31.2	.	9.6	0.5	.
Norway	11.3	21.2	27.7	29.5	29.9	30.5	26.8	28	28.1	28.8	9.9	6.5	1.1	17.5
Poland	.	.	.	.	.	.	35.7	34.2	35.2	34.9	.	.	.	.
Portugal	6	17.7	25.5	28.2	29.5	30.1	30.4	30.7	29.5	30.9	11.7	7.8	5.4	24.9
Russia	.	.	41.8	.	.	.	37.2	37.3	37.8	.	.	.	.	.
Spain	13.7	23.2	29.4	31.2	33.1	35.1	36.7	38.3	39.2	39.9	9.5	6.2	10.4	26.2
Sweden	9.5	15.1	.	.	.	.	22.2	22.1	22.1	22.1	5.6	.	.	12.6
Switzerland	8	11.4	15.8	18.7	19.3	20.4	21.1	21.5	21.8	21.6	3.4	4.4	5.7	13.6
Turkey	.	9.3	.	.	.	.	36	37.6	38.5	40.1	.	.	.	.
United Kingdom	8.7	18.8	22.3	24.5	24.9	25.5	25.5	25.5	25.6	26.8	10.1	3.5	4.5	18.1
United States	25.5	29.4	34	40	38.8	38.3	37.2	36.6	36.3	36.1	3.9	4.6	2	10.6

- Source: OECD Education Database, 2018. This table reports the percent of people aged 18 to 24 enrolled in Upper Secondary education or above (enrollment includes part-time and full-time). It includes the same countries as the original Table 1 in the most recent draft, and the first two columns (1985 and 1995) are taken from the draft.
- Missing values indicate that no data were reported, or that data reported were inconsistent, as defined by the OECD flag.
- The last four columns indicate the percentage point change between the given years.

Table A-2: Participation in Lower and Upper Secondary Education, Ages 14-17: 1985-2016

Country	1985	1995	2005	2010	2011	2012	2013	2014	2015	2016	1985-95	1995-2005	2005-16	1985-2016
Australia	.	93.4	93.1	94.1	95.3	94.8	95.4	95.8	98.1	98.4	.	-0.3	5.3	.
Austria	85.5	94.4	.	89	89.3	89.4	89.5	89.7	89.5	88.1	8.9	.	.	2.6
Belgium	91.4	101.1	100.5	98.7	98.5	99.2	98.6	97.8	97.4	97.4	9.7	-0.6	-3.1	6
Canada	.	89.1	.	.	.	90.6	91.3	91.1	92.8	98.3	.	.	.	.
Czech Republic	.	93.9	.	.	.	.	98.1	98.2	98.2	98	.	.	.	.
Denmark	89.1	92.8	89.3	93.7	94.8	95.5	95.9	95.8	95.8	95.7	3.7	-3.5	6.5	6.6
Finland	89.8	95.2	97.5	97	96.7	96.4	96.6	96.2	96.8	97.1	5.4	2.3	-0.4	7.3
France	88.5	95.3	93.4	92.8	93.1	93.7	93.8	93.9	93.8	93.8	6.8	-1.9	0.5	5.3
Germany	94.5	96.4	91.8	95.2	96.8	96.3	96.1	96.1	95.6	94.1	1.9	-4.6	2.2	-0.4
Greece	.	77.8	.	.	.	.	.	93	94.1	93.7	.	.	.	.
Hungary	.	89	97.7	100.2	100	96.4	95.9	95.6	94.4	94.3	.	8.7	-3.5	.
Iceland	.	89.4	.	.	.	.	96	95.8	95.9	95.8	.	.	.	.
Ireland	.	89.7	.	.	.	.	98	98.4	98	98.1	.	.	.	.
Italy	60.9	.	.	.	.	.	97.1	95.7	95.8	95.3	.	.	.	34.4
Japan	.	101.2	.	.	.	.	97.8	101	98.1	96.8	.	.	.	.
Korea	.	96	95.4	94.9	96.2	96.9	97.1	97.1	97.9	98.7	.	-0.6	3.2	.
Luxembourg	.	80.4	.	.	.	.	90.3	90.3	90.2	90.5	.	.	.	.
Mexico	.	43.3	59.9	67.9	68.1	68.2	69.2	71	74.4	76.3	.	16.6	16.4	.
Netherlands	92.2	96.6	90.5	96.1	96.2	96.4	96.5	96.5	97.1	97	4.4	-6.1	6.5	4.8
New Zealand	.	94.9	87.2	92.1	94.3	94.5	97.4	93.8	94.2	94.9	.	-7.7	7.7	.
Norway	90	96.1	98.6	97.1	97.5	97.7	97	96.8	96.8	96.8	6.1	2.5	-1.8	6.8
Poland	.	.	96.7	.	.	.	95.8	95.4	95	94.7	.	.	-2	.
Portugal	40	76.3	84.5	94.3	95.2	96.6	97.3	96.9	96.7	96.4	36.3	8.2	11.9	56.4
Russia	.	.	59.3	65.7	.	.	68.5	68.6	68.4	68.7	.	.	9.4	.
Spain	67.2	87.3	91.6	93.4	94.7	94.9	95.1	94.7	94.5	94.5	20.1	4.3	2.9	27.3
Sweden	91.4	97.1	.	.	.	.	98.9	98.6	98.8	100.2	5.7	.	.	8.8
Switzerland	88	90.7	94	94.8	94.5	93.4	95	95	95.1	94.9	2.7	3.3	0.9	6.9
Turkey	27.7	42.9	.	.	.	.	82.3	84.8	85.5	85.3	15.2	.	.	57.6
United Kingdom	77.3	88.7	.	94	91.3	90.9	94.5	100.3	101	97.6	11.4	.	.	20.3
United States	89.7	90.3	92.9	92.5	92.6	93.1	93.5	94.3	95.3	97.2	0.6	2.6	4.3	7.5

- Source: OECD Education Database, 2018. This table reports the percent of people aged 14 to 27 enrolled in Lower and Upper Secondary education (enrollment includes part-time and full-time). It includes the same countries as the original Table 1 in the most recent draft, and the first two columns (1985 and 1995) are taken from the draft.
- Missing values indicate that no data were reported, or that data reported were inconsistent, as defined by the OECD flag.
- The last four columns indicate the percentage point change between the given years.

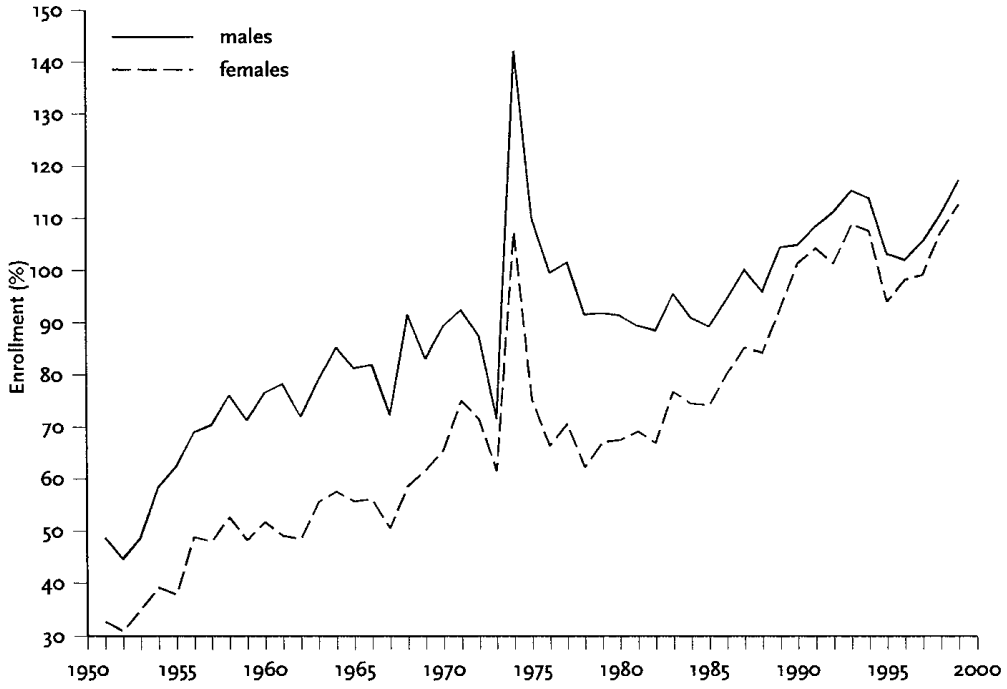
Table A-3: Participation in Higher Secondary Education, Ages 18-24: 1985-1995

Country	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1985-95 change[1]
Australia	–	–	–	–	–	–	22.2	33.3	22.9	18.9	23.9	–
Austria	–	–	–	–	–	–	–	14.5	12.3	12.9	14.7	–
Belgium	17.6	18.0	18.8	19.2	–	–	21.9	22.7	26.5	28.3	31.0	13.4
Canada	–	–	–	–	–	–	21.9	22.6	29.9	34.0	32.2	–
Czech Republic	–	–	–	–	–	–	–	10.0	–	12.4	13.3	–
Denmark	11.3	11.3	11.4	11.9	12.2	12.7	13.3	14.4	14.9	15.1	15.4	4.1
Finland	13.3	–	–	–	–	17.6	–	19.6	21.1	22.3	22.6	9.3
France	15.9	16.4	16.8	17.4	18.5	20.0	21.6	23.7	–	27.3	28.1	12.2
Germany[2]	11.9	11.7	11.4	11.3	11.7	12.2	–	–	13.3	13.2	13.9	2.0
Greece	–	–	–	–	–	–	–	15.2	24.9	25.7	23.7	–
Hungary	–	–	–	–	–	–	8.4	8.6	–	9.8	10.6	–
Iceland	–	–	–	–	–	–	–	–	–	13.1	13.8	–
Ireland	–	11.4	11.7	12.2	13.5	14.5	15.2	19.7	19.5	21.4	21.3	–
Italy	–	–	–	–	–	–	–	–	–	–	–	–
Japan	–	–	–	–	–	–	–	–	–	–	–	–
Korea	–	–	–	–	–	–	–	–	23.7	25.7	27.4	–
Luxembourg	–	2.1	2.3	2.6	2.6	–	–	–	–	–	–	–
Mexico	–	–	–	–	–	–	–	–	0.6	0.6	7.3	–
Netherlands	13.7	13.9	14.2	14.9	15.6	16.7	18.0	19.2	–	21.4	22.3	8.6
New Zealand	–	12.8	15.6	16.2	19.0	16.7	18.1	19.9	–	22.6	21.1	–
Norway	11.3	11.1	12.2	12.5	13.8	15.8	17.1	18.3	–	21.0	21.2	9.9
Poland	–	–	–	–	–	–	–	11.1	12.3	14.2	–	–
Portugal	6.0	5.1	6.3	–	–	–	11.0	–	16.0	17.6	17.7	11.7
Russia[3]	–	–	–	–	–	–	–	21.3	–	–	–	–
Spain	13.7	14.8	15.4	16.5	17.6	18.7	19.2	20.2	20.4	22.6	23.2	9.5
Sweden	9.5	9.4	9.7	9.8	10.0	10.2	10.8	11.9	12.9	14.1	15.1	5.6
Switzerland	8.0	8.0	8.3	8.4	8.7	9.3	9.7	10.3	10.7	11.1	11.4	3.4
Turkey	–	–	–	4.6	5.5	6.2	6.7	7.1	–	9.3	9.3	–
United Kingdom	8.7	10.4	10.6	10.8	11.0	11.7	12.7	13.2	15.4	17.2	18.8	10.1
United States	25.5	25.5	26.3	27.8	28.2	28.8	29.3	31.1	29.4	29.4	29.4	3.9
Average[4]	12.8	13.2	13.6	14.2	14.6	15.2	15.8	16.8	17.3	18.3	18.9	6.1

– No data were reported or data were incomplete or inconsistent.
[1]Percentage points change between 1985 and 1995.
[2]Pre-1991 numbers refer to Western Germany (Federal Republic of Germany before unification).
[3]Not an OECD member country
[4]Average is for countries reporting data for all years included in the table.
Note: Countries in bold are G-7 countries. Enrollment data include full-time and part-time enrollments.
Source: Organization for Economic Co-operation and Development (OECD), Education Database, 1998; U.S. Department of Commerce, Bureau of the Census, International Database, 1998.
Source: Baldi et al. (2000)

– No data were reported or data were incomplete or inconsistent. [1]Percentage points change between 1985 and 1995. [2]Pre-1991 numbers refer to Western Germany (Federal Republic of Germany before unification). [3]Not an OECD member country. [4]Average is for countries reporting data for all years included in the table.
Note: Countries in bold are G-7 countries. Enrollment data include full-time and part-time enrollments.
Source: Organization for Economic Co-operation and Development (OECD), Education Database, 1998; U.S. Department of Commerce, Bureau of the Census, International Database, 1998 and Baldi et al. (2000)
[JJH: Update]

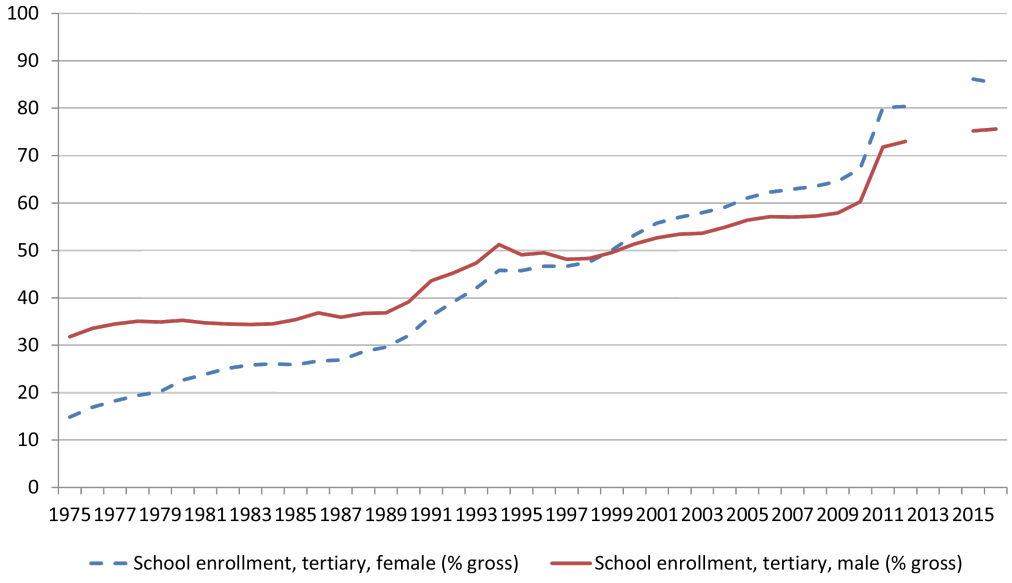
Figure A-4: First-Year University Enrollment (As Percentage of the Number of Qualified Secondary School Graduates)



Source: Canton and de Jong (2002)

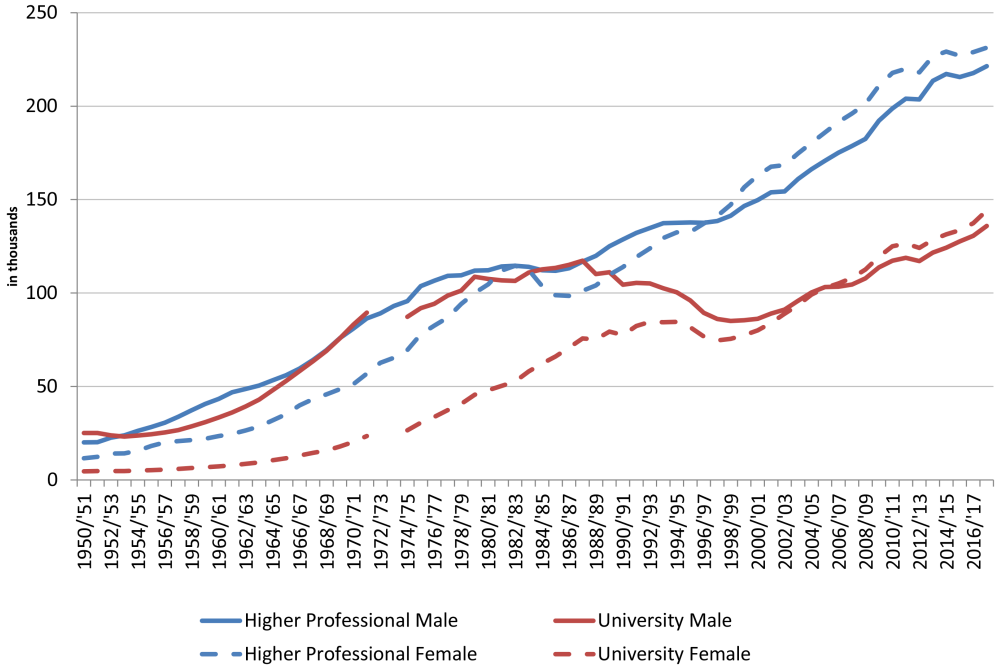
[**Typist: Linor added the figures below:**]

Figure A-5: Tertiary Enrollment (Gross %) by Gender – Netherlands



Source: UNESCO

Figure A-6: Enrollment in Higher Education, Netherlands



Source: CBS

Contributing to the shortage of skill in the face of rising demand is the problem of immigrant assimilation. The percentage of immigrants in the Dutch economy has grown enormously in the past 30 years from 2% in 1970 to 6% in 1990 and 14% in 2002. Many of these immigrants are unskilled and their children are unskilled as well (see Table 4). Drop out rates from secondary school are 50% for Turks, 55% for Moroccans, and 25% for Surinamese, compared to less than 10% for native Dutch. This reduces growth in the quality of the labor force at a time when skills are in great demand. The inheritance of low socioeconomic status across generations promises to perpetuate or even exacerbate social exclusion of immigrant groups, especially the non-Dutch speaking immigrants who constitute the bulk of the recent immigration (Veenman, 2002).

Table A-4: Participation in Lower and Upper Secondary Education, Ages 14-17: 1985-1995

Country	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1985-95 change[1]
Australia	–	–	–	–	–	–	83.2	81.2	91.0	91.7	93.4	–
Austria	85.5	–	–	–	12.1	–	–	–	91.8	93.1	94.4	8.9
Belgium	91.4	92.6	93.0	92.3	–	–	94.3	98.2	101.5	101.6	101.1	9.7
Canada	–	–	–	–	–	–	86.7	81.6	90.3	89.7	89.1	–
Czech Republic	–	–	–	–	–	–	–	81.1	–	88.4	93.9	–
Denmark	89.1	90.1	90.6	91.0	90.8	90.3	90.0	90.6	90.5	91.5	92.8	3.1
Finland	89.8	–	–	–	–	98.0	–	95.1	94.7	96.5	95.2	5.4
France	88.5	88.8	88.4	89.7	90.8	91.2	91.5	91.8	–	95.3	95.3	6.8
Germany[2]	94.5	94.8	95.7	96.3	88.5	94.1	–	–	91.6	95.9	96.4	1.9
Greece	–	–	–	–	–	–	–	77.6	76.5	76.2	77.8	–
Hungary	–	–	–	–	–	–	77.7	77.7	–	88.0	89.0	–
Iceland	–	–	–	–	–	–	–	–	–	89.9	89.4	–
Ireland	–	81.5	83.7	84.9	86.4	87.4	86.8	88.1	91.7	90.3	89.7	–
Italy	60.9	–	–	–	–	–	–	–	–	–	–	–
Japan	–	–	–	–	–	97.3	99.1	100.0	–	100.8	101.2	–
Korea	–	–	–	–	–	–	–	–	89.5	92.2	96.0	–
Luxembourg	–	80.3	81.6	80.6	79.3	–	–	–	–	–	80.4	–
Mexico	–	–	–	–	–	–	–	–	39.9	37.6	43.3	–
Netherlands	92.2	91.5	91.6	91.5	91.3	91.8	92.0	96.8	–	95.8	96.6	4.4
New Zealand	–	73.5	77.0	78.5	81.4	82.9	85.9	88.0	–	93.8	94.9	–
Norway	90.0	90.5	90.3	89.9	91.3	93.2	93.7	94.3	–	95.6	96.1	6.1
Poland	–	–	–	–	–	–	–	61.6	63.4	64.3	–	–
Portugal	40.0	43.6	41.4	54.5	–	–	63.8	–	66.5	75.0	76.3	36.3
Russia[3]	–	–	–	–	–	–	–	56.7	–	–	–	–
Spain	67.2	69.6	71.7	75.1	77.5	79.3	80.2	82.0	84.4	85.8	87.3	20.1
Sweden	91.4	92.5	92.5	92.3	91.9	91.4	91.3	93.0	95.5	96.6	97.1	5.7
Switzerland	88.0	88.1	88.1	88.3	88.3	88.8	88.9	90.1	90.2	90.5	90.7	2.7
Turkey	27.7	28.3	30.2	31.4	32.5	32.9	34.3	43.5	–	39.8	42.9	15.2
United Kingdom	77.3	78.2	79.5	80.4	82.0	82.8	83.6	91.8	87.5	88.6	88.7	11.4
United States	89.7	90.9	91.6	90.8	92.5	91.7	90.8	88.5	92.4	91.3	90.3	0.6
Average[4]	83.9	84.9	85.7	86.3	87.2	87.4	87.5	89.3	90.1	90.7	91.1	7.3

– No data were reported or data were incomplete or inconsistent.
[1]Percentage points change between 1985 and 1995.
[2]Pre–1991 numbers refer to Western Germany (Federal Republic of Germany before unification).
[3]Not an OECD member country.
[4]Average is for countries reporting data for all years included in the table.
Note: Countries in bold are G–7 countries. Enrollment data include full–time and part–time enrollments. See supplemental notes and tables for an explanation of why rates in some countries exceed 100.
Source: Organization for Economic Co–operation and Development (OECD), Education Database, 1998; U.S. Department of Commerce, Bureau of the Census, International Database, 1998.
Source: Baldi et al. (2000).

– No data were reported or data were incomplete or inconsistent. [1]Percentage points change between 1985 and 1995. [2]Pre-1991 numbers refer to Western Germany (Federal Republic of Germany before unification). [3]Not an OECD member country. [4]Average is for countries reporting data for all years included in the table.
Note: Countries in bold are G-7 countries. Enrollment data include full-time and part-time enrollments.
Source: Organization for Economic Co-operation and Development (OECD), Education Database, 1998; U.S. Department of Commerce, Bureau of the Census, International Database, 1998 and Baldi et al. (2000)
[JJH: Update]

Policies have been advocated to improve the process of immigrant assimi-

lation and to increase schooling attainment for the children of disadvantaged persons of Dutch origin through improving the quality of schools, through reducing tuition, through improving job training, and the like. These policies are the familiar ones and are also widely advocated in the US. empirically resolved.

[**Typist: Professor, Meera has updated Table 5 with the table and figure directly below.**]

Table A-5: TABLE 5 Update: Returns to Education (in % for an Additional Year of Education) from 1999-2012

	Men	Women
1999	7.2	6.5
2000	7.4	6.5
2001	7.9	6.9
2002	8.0	7.2
2003	8.1	7.0
2004	8.0	6.6
2005	8.3	7.0
2006	8.4	7.2
2007	8.9	7.3
2008	8.8	7.6
2009	8.9	7.6
2010	8.8	7.9
2011	8.7	7.3
2012	8.4	7.2

Source: Hartog and Gerritsen (2016)
This table uses data from the CBS Labour Market Panel Project for mean and women between the ages of 16 and 64. The original Table 5 (taken from Leuven and Oosterbeek, 2000) used data from two sources: NIPO (a Dutch opinion research institute) for 1999, and the International Adult Literacy Survey (IALS) for 1994. Respondents in both surveys ranged from 16 to 60 years old.

Figure A-7: Table 5 AS A GRAPH

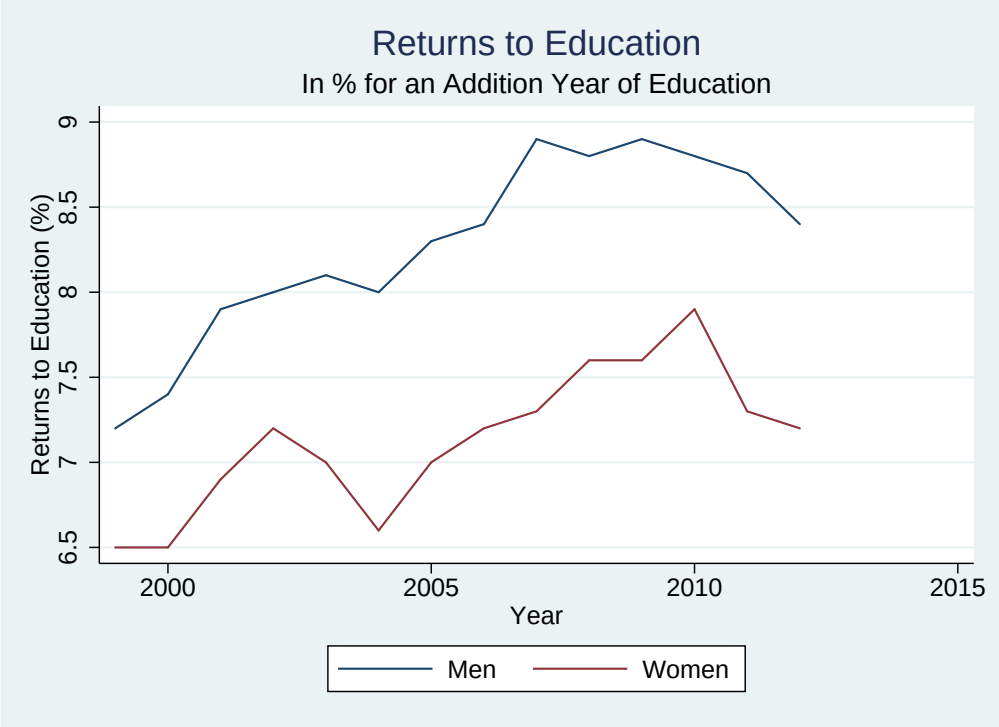


Table A-6: Returns to Education (in % for an Additional Year of Education)

	1994	1999	2000
Total	5.8	8.5	8.4
Male	5.7	8.0	8.0
Female	5.7	9.0	9.0

Source: Leuven and Oosterbeek (2000)

TABLE 4 – EDUCATIONAL ATTAINMENT OF PUPILS BY IMMIGRANT STATUS (19-20 YEARS; % OF TOTAL)

	Secondary			Intermediate		Higher University		
	Primary	Vocational	General	Vocational	General	Vocational	General	Total
Turks	15	22	34	11	12	4	3	100
Moroccans	17	22	28	16	12	3	2	100
Surinamese	8	16	18	17	20	8	12	100
Antilleans	8	15	14	14	8	18	23	100
Native Dutch	7	6	13	9	21	17	28	100

Source: Leuven and Oosterbeek (2000)
[JJH: Update]

Table A-7: Educational Attainment of Pupils by Immigrant Status (19-20 Years; % of Total)

	Secondary			Intermediate		Higher University		
	Primary	Vocational	General	Vocational	General	Vocational	General	Total
Turks	15	22	34	11	12	4	3	100
Moroccans	17	22	28	16	12	3	2	100
Surinamese	8	16	18	17	20	8	12	100
Antilleans	8	15	14	14	8	18	23	100
Native Dutch	7	6	13	9	21	17	28	100

Source: Van Ours and Veenman (2001)
[JJH: Update]

[Typist: Linor has updated the above table with the below:]

Table A-8: Population aged 15-65 years, by origin and education level 2012

	Primary	Secondary	Higher Education	Total
Native Dutch	7%	64%	29%	100%
Western Foreign Background	8%	58%	34%	100%
Non-Western Foreign Background	16%	63%	21%	100%
Turks	23%	68%	9%	100%
Moroccans	23%	67%	10%	100%
Surinamese	13%	66%	21%	100%

Source: CBS

What policies should be pursued to promote the supply of skilled labor? How effective are tuition policies? How much of the family income–schooling (or socioeconomic status)relationship is due to credit constraints that can be solved by using cash transfers to adolescents in their late adolescent years, and how much is due to more fundamental factors? Will improving schooling quality promote immigrant assimilation? Will tax or subsidy policy be effective?

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