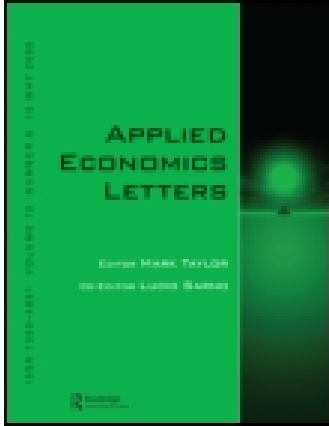


This article was downloaded by: [Harvard Library]

On: 19 August 2014, At: 10:05

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Applied Economics Letters

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/rael20>

Marriage, education and assortative mating in Latin America

Ina Ganguli^{ab}, Ricardo Hausmann^b & Martina Viarengo^{bc}

^a SITE, Stockholm School of Economics, SE-113 83 Stockholm, Sweden

^b Center for International Development and Harvard Kennedy School, Cambridge, MA 02138, USA

^c The Graduate Institute, Geneva 1202, Switzerland

Published online: 01 Apr 2014.

To cite this article: Ina Ganguli, Ricardo Hausmann & Martina Viarengo (2014) Marriage, education and assortative mating in Latin America, Applied Economics Letters, 21:12, 806-811, DOI: [10.1080/13504851.2013.849375](https://doi.org/10.1080/13504851.2013.849375)

To link to this article: <http://dx.doi.org/10.1080/13504851.2013.849375>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

Marriage, education and assortative mating in Latin America

Ina Ganguli^{a,b}, Ricardo Hausmann^b and Martina Viarengo^{b,c,*}

^a*SITE, Stockholm School of Economics, SE-113 83 Stockholm, Sweden*

^b*Center for International Development and Harvard Kennedy School, Cambridge, MA 02138, USA*

^c*The Graduate Institute, Geneva 1202, Switzerland*

In this article, we establish facts related to marriage and education in Latin American countries. Using census data from IPUMS International, we show how marriage and assortative mating patterns have changed from 1980 to 2000 and how the patterns in Latin America compare to the United States. We find that in Latin American countries, highly educated individuals are less likely to be married than the less educated, and the pattern is stronger for women. We also show that while it has been increasing over time, there is less positive assortative mating in Latin America than in the United States.

Keywords: development; marriage; education

JEL Classification: O12; J12; I20

I. Introduction

In the past three decades, countries in Latin America have undergone major economic and social changes, particularly the changes that have affected marriage patterns. Specifically, most Latin American countries have experienced an expansion of educational attainment and a reversal of the gender gap in education (Ganguli *et al.*, forthcoming). This fact has been extensively documented for the United States (Goldin *et al.*, 2006) and the OECD countries (OECD, 2002). Equally important in Latin America has been an increase in women's labour force participation in the formal sector (World Bank, 2012). This has led to changes in the types of partners that individuals may choose.

On marriage markets, in recent years, there is a burgeoning literature that has attempted to provide a theoretical basis for the matching behaviour of men and women. The empirical evidence, however, has been focused on the United States and a limited number of developed countries (e.g. Stevenson and Wolfers (2007) for the United States and Blossfeld and Timm (2003) for the advanced

economies). In this article, we seek to add to the literature on marriage markets by providing empirical evidence from Latin America by examining how the propensities to marry and assortative mating patterns have changed over time (1980–2000).

II. Theory

In his foundational theory of marriage, Gary Becker (1973, 1981, 1991) applies the theory of preferences by assuming that expected gains from marriage are greater than gains from remaining single. Weiss (1997) summarizes the main economic reasons for marriage as division of labour, coordination of investment activities, sharing of collective public goods and risk pooling.

Educational assortative mating appears to be not only an important dimension of sorting by mates, but also fundamental to understanding patterns of intergenerational mobility given the central role that education plays in labour market outcomes (Mare, 2008). In

*Corresponding author. E-mail: martina.viarengo@graduateinstitute.ch

Additional affiliation for Ricardo Hausmann is Santa Fe Institute, Santa Fe, NM 87501, USA.

Becker's (1981, 1991) classic model, the main focus of the family is on 'joint production', where spouses specialize according to their comparative advantage. In this traditional household, greater gains are generated by a 'negative assortative mating', with wives focusing on household production and husbands on the labour market. Depending on the gains from 'negative assortative mating', women may marry a more (*hypergamy*) or less (*hypogamy*) educated man.

Stevenson and Wolfers (2007) present a theoretical framework that acknowledges the changing nature of family as an institution. Their focus is on the shift from 'joint production' to 'joint consumption'. Women are becoming more educated and have increased their labour force participation, which has led to a decline in the scope for specialization and increased gains from joint consumption. As a consequence of this, we would expect a greater 'positive assortative mating' (*homogamy*) among the more educated individuals.

Empirical evidence for the United States suggests that while marriage rates have declined over time, the propensity to marry has increased for the college-educated and it's now at a historic high (Stevenson and Wolfers, 2007). Moreover, educational assortative mating has become more important over time (Pencavel, 1998; Rose, 2001; Schwartz and Mare, 2005). On the other hand, more limited evidence for a sample of developed countries suggests heterogeneous patterns (Blossfeld and Timm, 2003).

III. Empirical Analysis and Results

Description of data

Data for the analysis comes from the International Integrated Public Use Microdata Series (IPUMS-International). Compiled by the Minnesota Population Center (2013), the IPUMS data includes the largest publicly available individual-level census data. It consists of decennial records of persons and households. We use data for Latin American countries from the 1980s to 2000s. We focus on individuals aged 26–35. Following the literature, we focus on this age group as these individuals have completed their education and made the core of their marriage decisions, which thus reflect more closely patterns of the time.

Models and results

First, we estimate the relationship between education and the probability of marriage for men and women for nine Latin American countries. Following Rose (2001) for the United States, we test for changes in the relationship

between education and marriage across decades. We estimate the following empirical model:

$$\begin{aligned} \Pr(M)_{it} = & \alpha_0 + \beta_1 \text{Primary}_{it} + \beta_2 \text{Secondary}_{it} \\ & + \beta_3 \text{Tertiary}_{it} + D1990_{it} + D2000_{it} \\ & + \gamma_1 \text{Primary}_{it} D1990_{it} + \gamma_2 \text{Secondary}_{it} D1990_{it} \\ & + \gamma_3 \text{Tertiary}_{it} D1990_{it} + \delta_1 \text{Primary}_{it} D2000_{it} \\ & + \delta_2 \text{Secondary}_{it} D2000_{it} \\ & + \delta_3 \text{Tertiary}_{it} D2000_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

where $\Pr(M)_{it}$ is the propensity to marry for individual i in decade t . Included in the regressions are Primary, Secondary and Tertiary dummies for education levels (less than Primary is excluded), and decade dummies $D1990$ and $D2000$ ($D1980$ is excluded).¹ β , γ and δ are coefficients to be estimated. We estimate this model using OLS for both men and women aged 26–35. The results in Table 1 show that for most Latin American countries, higher education is associated with a lower likelihood of marriage, and the likelihood of the more educated being married has decreased over time. This pattern appears to be more important for educated women than for educated men. These results are in contrast to the United States, where the highly educated are becoming more likely to marry.

Next, we look at the degree of similarity between spouses by examining patterns of assortative mating in terms of partners' education. Following the methodology typically applied in the literature (Pencavel, 1998; Blossfeld and Timm, 2003; Schwartz and Mare, 2005; Mare, 2008), we construct country-level matrices of observed matching probabilities according to the spouses' level of education for the three decades: 1980s, 1990s and 2000s. From this, we derive the degree of educational similarity between spouses by dividing the sum of the diagonal of each matrix by the sum of the off-diagonal elements.

As shown in Fig. 1, we find that homogamy has increased for most Latin American countries in the last decade, but there is less homogamy than in the United States. On the other hand, women have become more likely to marry someone with a lower, rather than higher level of educational attainment.

IV. Conclusion

We observe that the marriage market in Latin America shows different patterns than those observed elsewhere, and especially those observed in the United States, where much of the literature has been focused. We have shown that particularly

¹ Bolivia's D1980 is 1976; Costa Rica's D1980 is 1973 and D1990 is 1984.

Table 1. Effect of education on likelihood of marriage

	Argentina (1)	Bolivia (2)	Brazil (3)	Chile (4)	Colombia (5)	Costa Rica (6)	Ecuador (7)	Panama (8)	Venezuela (9)	USA (10)
Women										
Dummy 1990s	-0.00424 (0.00291)	0.00549 (0.00417)	-0.0186*** (0.00133)	-0.0196*** (0.00480)	-0.0103*** (0.00242)	-0.00656 (0.00833)	-0.00838** (0.00416)	0.00331 (0.0108)	0.00713** (0.00335)	-0.0854*** (0.00587)
Dummy 2000s	-0.442*** (0.00370)	-0.0167*** (0.00416)	-0.0298*** (0.00109)	-0.0666*** (0.00559)	-0.00809*** (0.00241)	-0.0382*** (0.00855)	-0.0598*** (0.00416)	-0.00830 (0.0110)	-0.0310*** (0.00381)	-0.0609*** (0.00591)
Primary	-0.0308*** (0.00225)	-0.0433*** (0.00631)	-0.0936*** (0.00204)	-0.00168 (0.00381)	-0.0409*** (0.00230)	-0.0666*** (0.00890)	-0.0548*** (0.00421)	-0.0685*** (0.00887)	-0.0411*** (0.00307)	0.0965*** (0.00429)
Secondary	-0.130*** (0.00432)	-0.131*** (0.0104)	-0.154*** (0.00213)	-0.0801*** (0.00450)	-0.133*** (0.00302)	-0.0963*** (0.0239)	-0.142*** (0.00579)	-0.125*** (0.0113)	-0.150*** (0.00586)	0.146*** (0.00414)
Tertiary	-0.153*** (0.00574)	-0.209*** (0.0306)	-0.184*** (0.00337)	-0.118*** (0.00972)	-0.223*** (0.00450)	-0.0227 (0.0199)	-0.227*** (0.0113)	-0.207*** (0.0164)	-0.148*** (0.00738)	0.0952*** (0.00424)
Primary × 1990s	0.0159*** (0.00337)	0.0232*** (0.00781)	0.0348*** (0.00286)	0.0325*** (0.00562)	0.0160*** (0.00316)	0.0216* (0.0116)	0.0260*** (0.00575)	0.00268 (0.0132)	-0.0213*** (0.00424)	-0.0360*** (0.00618)
Secondary × 1990s	0.00817 (0.00527)	0.0211* (0.0118)	0.00458 (0.00302)	0.0255*** (0.00622)	-0.0187*** (0.00384)	0.0307 (0.0273)	0.0109 (0.00734)	-0.0417*** (0.0152)	-0.0321*** (0.00736)	0.00896 (0.00593)
Tertiary × 1990s	-0.0259*** (0.00700)	-0.00284 (0.0325)	-0.00761 (0.00472)	0.0278** (0.0125)	-0.00909 (0.00910)	-0.0869*** (0.0244)	0.00493 (0.0131)	-0.0238 (0.0211)	-0.0339*** (0.0111)	0.0488*** (0.00606)
Primary × 2000s	0.156*** (0.00417)	0.0324*** (0.00765)	0.0486*** (0.00237)	0.0464*** (0.00637)	0.0338*** (0.00321)	0.0940*** (0.0115)	0.0543*** (0.00563)	0.0349*** (0.0132)	0.0284*** (0.00447)	-0.0851*** (0.00625)
Secondary × 2000s	0.257*** (0.00557)	-0.0270** (0.0114)	0.00361 (0.00247)	0.0323*** (0.00675)	0.00359 (0.00381)	0.0258 (0.0254)	0.0589*** (0.00705)	-0.0187 (0.0150)	-0.0136*** (0.00690)	-0.0825*** (0.00597)
Tertiary × 2000s	0.225*** (0.00717)	-0.0877*** (0.0315)	-0.0349*** (0.00396)	-0.0292** (0.0119)	-0.00791 (0.00558)	-0.130*** (0.0224)	0.0335*** (0.0127)	-0.0547*** (0.0201)	-0.0812*** (0.0214)	0.00652 (0.00608)
Constant	0.819*** (0.00180)	0.819*** (0.00275)	0.812*** (0.000800)	0.749*** (0.00309)	0.758*** (0.00169)	0.784*** (0.00564)	0.837*** (0.00285)	0.815*** (0.00687)	0.758*** (0.00241)	0.581*** (0.00409)
Observations	736 947	127 156	1 501 761	324 520	761 999	59 322	208 523	54 025	407 148	2 950 283
R-squared	0.096	0.032	0.027	0.014	0.023	0.012	0.023	0.029	0.018	0.014
Men										
Dummy 1990s	0.000609 (0.00303)	-0.0132** (0.00538)	-0.0449*** (0.00138)	-0.0713*** (0.00505)	-0.0383*** (0.00257)	-0.0157* (0.00899)	-0.0187*** (0.00490)	-0.0267** (0.0119)	-0.0881*** (0.00342)	-0.171*** (0.00551)
Dummy 2000s	-0.414*** (0.00370)	-0.0655*** (0.00549)	-0.0781*** (0.00111)	-0.164*** (0.00579)	-0.0527*** (0.00247)	-0.0656*** (0.00866)	-0.0702*** (0.00463)	-0.0478*** (0.0117)	-0.102*** (0.00376)	-0.184*** (0.00545)
Primary	0.0648*** (0.00233)	-0.00382 (0.00574)	-0.0327*** (0.00202)	0.0960*** (0.00413)	0.0166*** (0.00252)	0.0110 (0.00929)	-0.00619 (0.00446)	0.0711*** (0.00960)	0.0644*** (0.00327)	0.126*** (0.00415)
Secondary	0.0490*** (0.00444)	-0.129*** (0.00860)	-0.0870*** (0.00236)	0.0728*** (0.00495)	-0.0487*** (0.00324)	-0.0122 (0.0221)	-0.0726*** (0.00625)	0.0693*** (0.0130)	0.00696 (0.00574)	0.143*** (0.00397)
Tertiary	0.0225*** (0.00505)	-0.123*** (0.0150)	-0.0576*** (0.00323)	0.0665*** (0.00840)	-0.0974*** (0.00426)	0.0183 (0.0211)	-0.0660*** (0.00860)	0.0593*** (0.0170)	0.0580*** (0.00703)	0.126*** (0.00404)
Primary × 1990s	0.000641 (0.00350)	0.0206*** (0.00782)	0.0235*** (0.00291)	0.0229*** (0.00588)	0.0293*** (0.00340)	0.0283** (0.0123)	0.00526 (0.00627)	-0.0416*** (0.0143)	0.0150*** (0.00434)	-0.00304 (0.00585)
Secondary × 1990s	-0.0604*** (0.00552)	0.0263** (0.0105)	0.0224*** (0.00334)	0.0393*** (0.00667)	0.00221 (0.00411)	0.0257 (0.0258)	0.0106 (0.00805)	-0.0237 (0.0172)	0.0139* (0.00739)	0.0596*** (0.00558)
Tertiary × 1990s	-0.0697*** (0.00552)	-0.0709*** (0.0105)	-0.0273*** (0.00334)	-0.00227 (0.00667)	0.0475*** (0.00411)	-0.0246 (0.0258)	-0.0301*** (0.00805)	-0.0755*** (0.0172)	-0.0366*** (0.00739)	0.0988*** (0.00558)

Primary × 2000s	(0.00646) 0.0829*** (0.00418)	(0.0179) 0.0331*** (0.00776)	(0.00487) 0.0380*** (0.00237)	(0.0111) 0.0437*** (0.00658)	(0.00925) 0.0213*** (0.00337)	(0.0251) 0.0379*** (0.0118)	(0.0109) 0.0368*** (0.00596)	(0.0228) -0.0156 (0.0139)	(0.0117) 0.0360*** (0.00448)	(0.00569) -0.0538*** (0.00579)
Secondary × 2000s	0.114*** (0.00570)	0.0175* (0.0102)	0.0145*** (0.00273)	0.0217*** (0.00710)	0.000586 (0.00405)	-0.0208 (0.0238)	0.0482*** (0.00764)	-0.0243 (0.0167)	-0.00338 (0.00687)	0.00369 (0.00552)
Tertiary × 2000s	0.118*** (0.00678)	-0.125*** (0.0170)	-0.0825*** (0.00406)	-0.0715*** (0.0108)	-0.0967*** (0.00561)	-0.151*** (0.0234)	-0.0378*** (0.0105)	-0.160*** (0.0217)	-0.185*** (0.0277)	0.0670*** (0.00563)
Constant	0.691*** (0.00186)	0.815*** (0.00330)	0.789*** (0.000832)	0.666*** (0.00342)	0.703*** (0.00183)	0.743*** (0.00590)	0.790*** (0.00329)	0.651*** (0.00754)	0.678*** (0.00261)	0.553*** (0.00391)
Observations	722 158	121 523	1 451 301	312 704	706 099	57 774	199 640	53 678	405 408	2 882 400
R ²	0.100	0.034	0.012	0.022	0.013	0.014	0.009	0.009	0.013	0.025

Notes: All regressions include individuals age 26 to 35. Less than Primary and 1980s dummy are excluded. Bolivia's 1980s dummy is 1976; Costa Rica's 1980s dummy is 1973; and 1990s dummy is 1984. Census waves are as follows: Argentina: 1980, 1991, 2001; Bolivia: 1976, 1992, 2001; Brazil: 1980, 1991, 2000; Chile: 1982, 1992, 2002; Colombia: 1985, 1993, 2005; Costa Rica: 1973, 1984, 2000; Ecuador: 1982, 1990, 2001; Panama: 1980, 1990, 2000; and USA: 1980, 1990, 2000.

***p < 0.01, **p < 0.05, *p < 0.1.

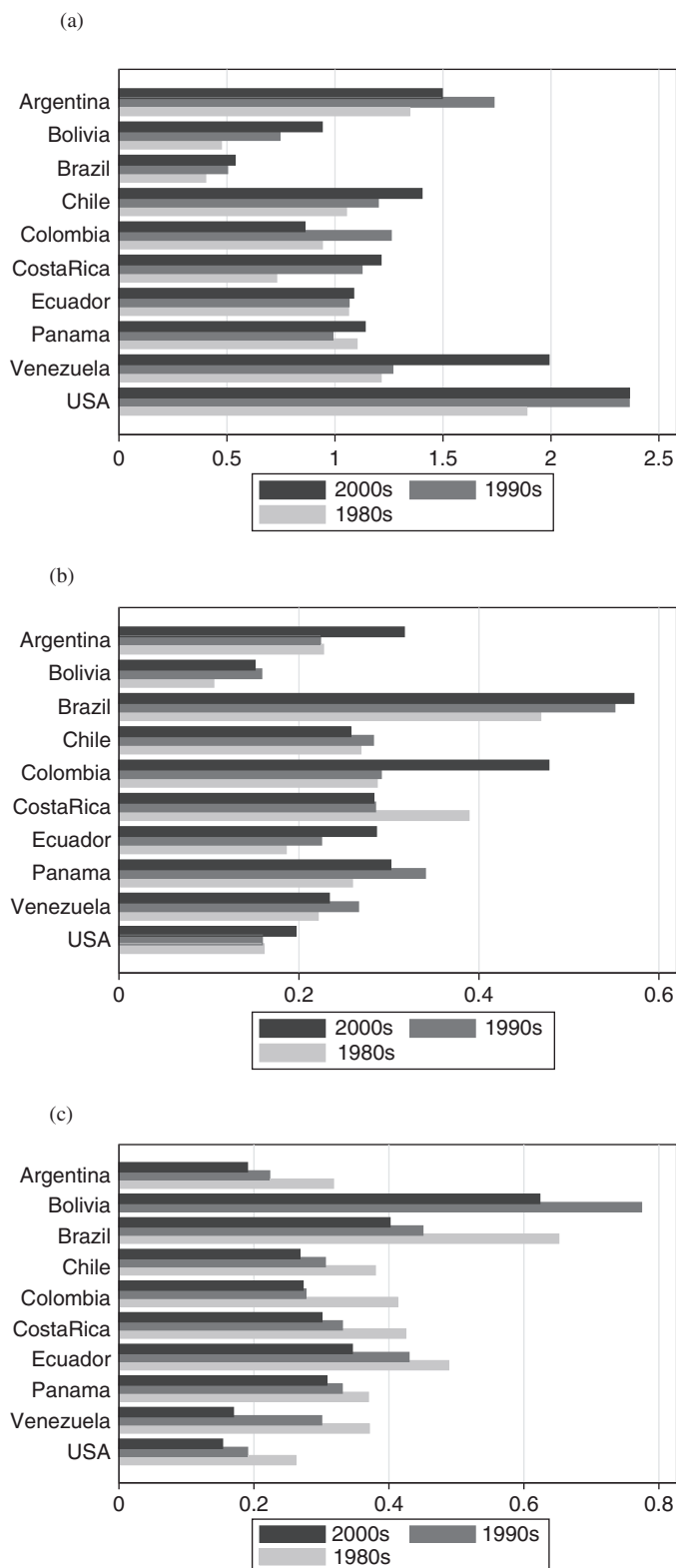


Fig. 1. Assortative mating by educational attainment. (a) Odds of husband and wife having same schooling (Homogamy). (b) Odds of wife 'Marrying Down' (Hypogamy). (c) Odds of wife 'Marrying Up' (Hypergamy)
 Note: The value for Bolivia 1980 is 1.4 (excluded from Fig. 1(C)).

for women, the highly educated in Latin America are less likely to get married. Moreover, when women marry, they are more likely to marry someone with a lower level of education.

Acknowledgements

We gratefully acknowledge support received from the Women and Public Policy Program and the Women's Leadership Board at the Harvard Kennedy School, and the Center for International Development at Harvard University. We would like to thank Iris Bohnet, Marcela Escobari, Claudia Goldin, Victor Lavy, Lant Pritchett, Roberto Rigobon and Rodrigo Soares for their helpful comments and discussions.

References

- Becker, G. S. (1973) A theory of marriage: Part I, *Journal of Political Economy*, **81**, 813–46.
- Becker, G. S. (1981, 1991) *A Treatise on the Family*, expanded edn, Harvard University Press, Cambridge, MA.
- Blossfeld, H.-P. and Timm, A. (2003) *Who Marries Whom?: Educational Systems as Marriage Markets in Modern Societies*, Kluwer Academic Publishers, Dordrecht.
- Ganguli, I., Hausmann, R. and Viarengo, M. (forthcoming) Closing the gender gap in education: what is the state of gaps in labor force participation for women, wives and mothers?, *International Labour Review*.
- Goldin, C., Katz, L. and Kuziemko, I. (2006) The homecoming of American college women: the reversal of the gender gap in college, *Journal of Economic Perspectives*, **20**, 133–56.
- Mare, R. D. (2008) *Educational Assortative Mating in Two Generations*, University of California, Los Angeles, CA.
- Minnesota Population Center (2013) *Integrated Public Use Microdata Series, International: Version 6.2 [Machine-readable database]*, University of Minnesota, Minneapolis, MN.
- OECD (2002) *Education at a Glance 2002*, OECD, Paris.
- Pencavel, J. (1998) Assortative mating by schooling and the work behavior of wives and husbands, *American Economic Review*, **88**, 326–9.
- Rose, E. (2001) *Marriage and Assortative Mating: How Have the Patterns Changed?*, mimeo, University of Washington, Washington, DC.
- Schwartz, C. R. and Mare, R. D. (2005) Trends in educational assortative marriage from 1940 to 2003, *Demography*, **42**, 621–46.
- Stevenson, B. and Wolfers, J. (2007) Marriage and divorce: changes and their driving forces, *Journal of Economic Perspectives*, **21**, 27–52.
- Weiss, Y. (1997) The formation and dissolution of families: why marry? Who marries whom? And what happens upon divorce, in *Handbook of Population and Family Economics*, Rosenzweig, M. R. and Stark, O. (Eds.), Vol. 1A, Elsevier, Amsterdam, pp. 81–124.
- World Bank (2012) *The Effect of Women's Economic Power in Latin America and the Caribbean*, World Bank Publication, Washington, DC.