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The Currency of Knowledge: Education and economic growth in Latin America

Andrew Thomas Bosz and Andrew Anthony Rufatt

ABSTRACT

In the early 1960s, Latin America was on the brink of significant economic growth, with school attainment and income levels well ahead of East Asia. However, by 2000, despite greater financial and political efforts to develop their education system to the standard of fully developed countries, Latin America had already been well surpassed by East Asia. By considering the influence of education and human capital accumulation, this paper endeavours to rationalise the disparities between the economic failures of Latin America by comparison to the economic prosperity of East Asia. Internationally standardised cognitive testing consistently shows Latin America below East Asia, indicating a greater quality of education in East Asia. Moreover, Latin America appears to experience some degree of difficulty in retaining its human capital due to 'brain drain'. As such, whilst the Latin American labour force continues to grow, the average level of education is deteriorating, which in turn adversely affects economic prosperity.

1. INTRODUCTION

Whilst East Asia basks in the security of its economic prosperity, Latin America continues to experience a general lack of economic growth despite abundant land and natural resources (Birdsall 1999). Education is one of the most influential factors affecting productivity as it directly concerns the quality of knowledge and skills of human capital (Hanushek and Woessmann 2009). Although Latin American governments have committed at least as many resources to increase education as East Asia, accumulation of education has been relatively lax by comparison, serving only to exacerbate economic and social class disparities (Birdsall 1999, p. 2).

In this paper we will compare the failures in Latin American economic growth with the success of East Asian economic development by considering education as the most critical factor of human capital as per the endogenous growth model. First, we shall discuss the foundations of endogenous growth theory and how education can help explain economic growth. Second, we shall consider the differences in education between Latin America and East Asia in an endeavour to isolate the discerning factors that grant the two regions near polar opposite levels of success.

2. ENDOGENOUS GROWTH

At its core, endogenous growth theory is comprised of two fundamental ideas. First, the theory considers technological progress as a product of economic activity, and second, that knowledge and technology are characterised by increasing returns, subsequently driving economic growth (Cortright 2011). As such, a lack of technological progress would ultimately result in a lack of economic growth.

The simplest expression of growth theory illustrates how domestic output is generated from a given stock of factors (Aghion & Durlauf 2009). Thus, consider the formula:

$$Y = A * F (K , L)$$

In the above formula, K is capital, L is labour, A is the productivity factor reflecting existing knowledge and resulting output efficiency of capital and labour, whilst F is the growth function that is usually assumed to exhibit constant returns to scale (Aghion & Durlauf 2009,

p. 8). There are several ways to rewrite the formula, however, the purpose of endogenous growth theory is essentially to explain the growth of A as a direct result of innovation, thus demonstrating productivity growth.

3. EDUCATION AND HUMAN CAPITAL

Considering that labour is an important input into economic growth, it stands to reason that education is important as it comprises the knowledge base of labour. Theoretical models of endogenous growth emphasise the importance of education as a production factor that may be accumulated, increasing the innovative capacity of the economy (Hanushek & Woessmann 2009).

Recent academic literature regarding nation-wide growth regressions and the impact of education rely largely on internationally comparable statistics on average years of schooling as a proxy for the human capital of a particular economy (Barro & Lee 2001). This method has typically identified a significant positive association between quantitative measures of education and economic growth (Krueger & Lindahl 2001). However, whilst reliance on the average years of schooling may seem a suitable universal gauge, it implicitly assumes a year of education conveys the same level of knowledge and skills across all education systems and that variation in the quality of non-school factors have only a negligible effect on educational outcomes (Hanushek & Woessmann 2009, p. 4). For instance, a year of education in Colombia is assumed to increase human capital as much as it would in Singapore.

A more appropriate measure of identifying causal disparities of education between economic regions would be to concentrate on cognitive skills (Hanushek & Woessmann 2009, p. 5). In a recent review, growth models estimated with data from across the world attribute low cognitive abilities as the reason for lacklustre economic growth in Latin America (Hanushek & Woessmann 2009).

Figure 1 reveals that whilst total gross domestic product (GDP) is greater in East Asia, when divided by resident populations, GDP per capita is greater in Latin America. This indicates that East Asia possesses a larger human capital base, which in itself is highly beneficial to output. However, despite Latin America's higher GDP per capita, East Asia has a higher

GDP per capita growth rate. If these trends continue, East Asia will eventually overtake Latin America in terms of GDP per capita – albeit this could take a decade or more.

*Figure 1: Comparison of Gross Domestic Product between Latin America and East Asia**

	GDP (current US\$ in billions)				GDP per capita (current US\$)				GDP per capita growth (annual %)			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
	World	55,805	61,259	58,078	63,044	8,442	9,161	8,587	9,216	2.74	0.33	-3.16
East Asia & Pacific	11,878	13,679	14,088	16,219	5,503	6,295	6,441	7,367	5.07	1.74	-1.26	6.38
Latin America & Caribbean	3,878	4,518	4,194	5,182	6,811	7,845	7,200	8,798	4.64	3.16	-2.91	5.01

**Based on World Bank 2011a; 2011b; 2011c*

4. LATIN AMERICA VERSUS EAST ASIA

In 2000, the Organisation for Economic Co-operation and Development (OECD) started its Programme for International Student Assessment (PISA), testing the cognitive skills of 15-year-old students in the areas of literacy, mathematics and science every three years (OECD 2010b). The most recent PISA testing was conducted in 2009, with 65 countries participating.

Figure 2 illustrates the scholastic performance of participating Latin American and East Asian countries for the 2000, 2003, 2006 and 2009 PISA tests. It is evident from the data that the performance of Latin American countries is significantly below the OECD average, whilst East Asian countries are consistently scoring above the OECD average. Thus, the average cognitive skills of Latin American students are consistently at the lower end of the international distribution. Regions above the OECD average increase labour productivity by two per cent for each per cent above the OECD average attained (Coulombe, Tremblay & Marchand 2004, p. 31).

*Figure 2: Comparing PISA Results between Participating Latin American and East Asian Countries**

	Reading Scale				Maths Scale				Science Scale			
	2000	2003	2006	2009	2000	2003	2006	2009	2000	2003	2006	2009
OECD Average	500	494	492	493	500	500	498	496	500	500	500	501
Shanghai – China	—	—	—	556	—	—	—	600	—	—	—	575
Korea	525	534	556	539	547	542	547	546	552	538	522	538
Hong Kong – China	525	510	536	533	560	550	547	555	541	548	542	549
Japan	522	498	498	520	557	534	523	529	550	539	531	539
Chinese Taipei	—	—	496	495	—	—	549	543	—	—	532	520
Macao – China	—	498	492	487	—	527	525	525	—	525	511	511
Chile	410	—	442	449	384	—	411	421	415	—	438	447
Uruguay	—	434	413	426	—	422	427	427	—	438	428	427
Mexico	422	400	410	425	387	385	406	419	422	405	410	416
Colombia	—	—	385	413	—	—	370	381	—	—	388	402
Brazil	396	403	393	412	334	356	370	386	375	390	390	405
Argentina	418	—	374	398	388	—	381	388	396	—	391	401
Panama	—	—	—	371	—	—	—	360	—	—	—	376
Peru	327	—	—	370	292	—	—	365	333	—	—	369

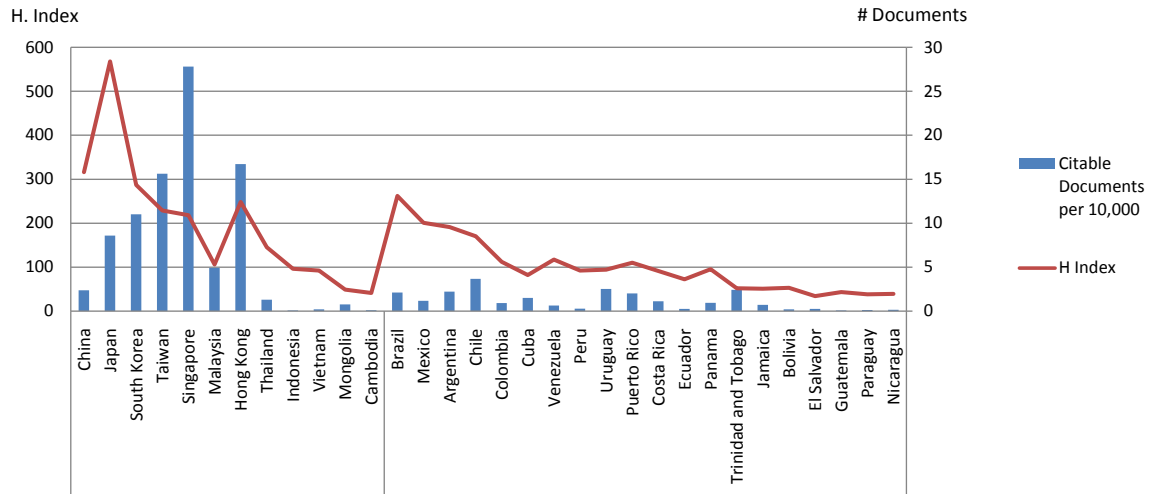
Significantly above OECD average	Not significantly different OECD average	Significantly below OECD average
-----------------------------------------	------------------------------------------	-----------------------------------------

**Based on OECD 2003; 2004; 2007; 2010b*

Further to primary and secondary education, the calibre and output of tertiary education in Latin America has also deteriorated in comparison to East Asia. A recent review of the world's top 200 universities by research output identified 27 East Asian universities, whilst Latin America was unrepresented due to tertiary underfunding and stifling governance structures (Baty 2010).

To further appreciate the contrast between Latin America and East Asia we can consider both the output of citable documents and the Hirsh index – a common gauge of the relative quality of published works. The combination of a poor Hirsch index in average terms, and the small volume of published research indicate both quality and quantity of research in Latin America is inferior to that of several East Asian nations.

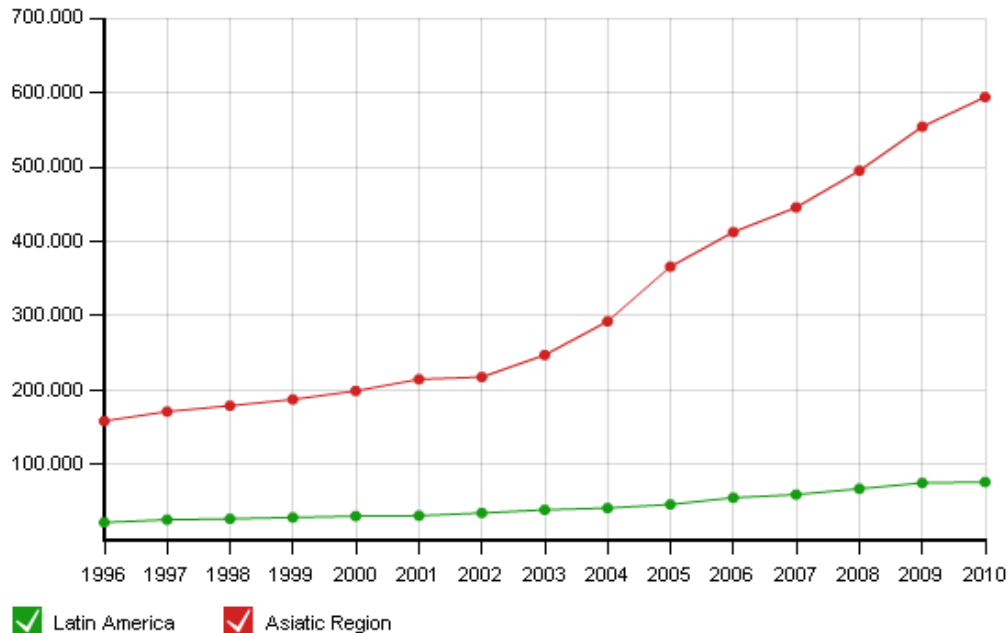
Figure 3: Hirsch Index and Research Document Output for 2010 in East Asia and Latin America*



*Based on CIA 2011 and SCImago 2007

Figure 3 shows that East Asia has surged in its output of citable documents per capita whilst published research in Latin America is rather negligible. This difference becomes even more apparent in a trend comparison over time, as demonstrated in Figure 4.

This exponentially broadening handicap in the quality of education could be correlated to the abatement of Latin American economic growth. The materiality of influence on growth attributed to the quality of education is generally undisputed, although quality is argued to be more significant towards economic growth than years of education (Hanushek & Kimko 2000).

Figure 4: Citable Document Trend between Latin America and the Asiatic Region*

*Source: SCImago 2007

5. PUBLIC EXPENDITURE ON EDUCATION

Consideration must be made not only towards development in human capital, but also its retention and accumulation. Interestingly, national expenditure on public education as a percentage of GDP remains relatively comparable between Latin America and East Asia – as demonstrated in Figure 5. Public expenditure measured in this context is indicative of the national commitment to allocate resources towards education (OECD 2010a, p. 1). As such, the disparity is not due to a lack of government willingness to commit public funds.

*Figure 5: Public Expenditure on Education as a Percentage of GDP**

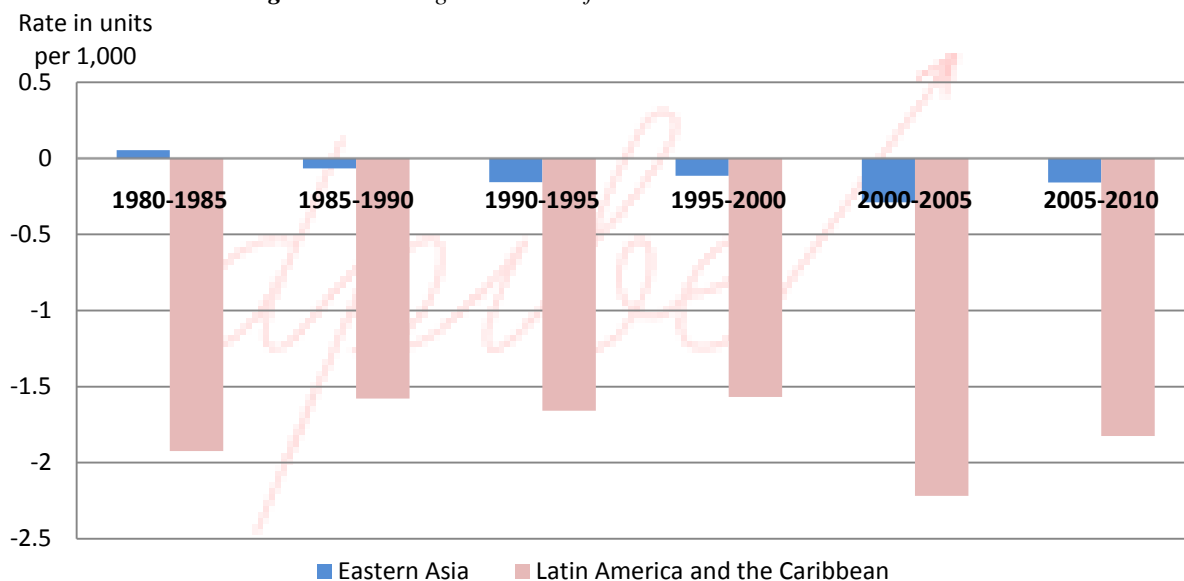
Region	Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
East Asia	Arithmetic average	3.7%	4.4%	4.2%	4.5%	4.6%	4.2%	4.4%	3.7%	3.6%	3.1%	3.8%
	China	1.9%	—	—	—	—	—	—	—	—	—	—
	Hong Kong	—	—	3.9%	4.0%	4.3%	4.6%	4.2%	3.9%	3.5%	3.3%	4.5%
	Japan	3.6%	3.7%	3.6%	3.6%	3.7%	3.7%	3.5%	3.5%	3.5%	—	—
	Macao	3.7%	3.7%	3.0%	3.1%	2.9%	2.3%	2.4%	2.3%	2.0%	2.2%	—
	Malaysia	5.7%	6.0%	7.5%	7.7%	7.5%	5.9%	7.5%	4.7%	4.5%	4.1%	—
	Republic of Korea	3.8%	—	4.1%	4.0%	4.4%	4.4%	4.1%	4.2%	4.2%	—	—
	Singapore	—	—	3.1%	—	—	—	—	—	—	2.6%	3.0%
LATAM	Arithmetic average	4.1%	4.0%	4.0%	4.2%	4.3%	4.3%	3.6%	4.0%	4.5%	5.3%	3.8%
	Antigua and Barbuda	3.2%	—	—	3.9%	—	—	—	—	—	—	2.7%
	Argentina	4.5%	4.6%	4.8%	4.0%	3.5%	3.8%	—	4.5%	4.9%	—	—
	Bolivia	5.7%	5.5%	5.9%	6.2%	6.4%	—	—	6.3%	—	—	—
	Brazil	3.9%	4.0%	3.9%	3.8%	—	4.0%	4.5%	5.0%	5.1%	—	—
	Chile	3.8%	3.9%	—	4.2%	4.1%	3.7%	3.4%	3.2%	3.4%	4.0%	—
	Colombia	4.4%	3.7%	3.9%	4.5%	4.5%	4.2%	4.0%	3.9%	4.1%	3.9%	4.8%
	Cuba	7.5%	7.2%	7.8%	8.9%	9.2%	9.6%	—	—	11.9%	13.6%	—
	Dominican Republic	—	1.9%	2.0%	2.0%	1.9%	—	—	—	2.2%	—	—
	Ecuador	1.8%	1.3%	1.0%	—	—	—	—	—	—	—	—
	El Salvador	2.3%	2.5%	2.5%	2.9%	2.8%	—	2.7%	3.0%	3.0%	3.6%	—
	Grenada	—	—	—	—	4.9%	—	—	—	—	—	—
	Mexico	4.4%	4.9%	5.2%	5.3%	5.3%	4.9%	5.0%	4.8%	4.8%	—	—
	Nicaragua	3.8%	3.9%	—	3.1%	3.1%	—	—	—	—	—	—
	Panama	4.8%	5.0%	4.3%	4.4%	4.4%	3.8%	—	—	—	3.8%	—
	Paraguay	5.1%	5.3%	5.1%	4.9%	4.7%	4.0%	—	—	4.0%	—	—
	Peru	3.4%	—	2.9%	3.0%	2.8%	2.8%	2.7%	2.5%	2.5%	2.7%	—
	Uruguay	2.4%	2.4%	2.8%	2.3%	2.1%	2.5%	2.7%	2.8%	—	—	—
	Venezuela	—	—	—	—	—	—	—	3.7%	3.7%	—	—

*Based on UNdata 2011b

6. HUMAN CAPITAL FLIGHT

To appreciate the impact of Latin American emigration on human capital we must understand both the volume and composition of the migrant population. The net migration rates in Figure 6 put into perspective the significant difference between the volumes of the two regions. East Asia's net negative migration rate is materially lower than that of Latin America. Under the growth model, a net emigration rate erodes human capital accumulation.

*Figure 6: Net Migration Rates for East Asia and Latin America**



**Based on UNdata 2011a*

The impact of migration flows can be further appreciated by analysing the number of emigrants as a proportion of the originating region's total population. As at 2010, the total emigrants from East Asia represented 1.1 per cent of the entire East Asian population, whilst total emigrants from Latin America comprised 5.2 per cent (World Bank 2011d, pp. 23 and 27). Whilst the volume of net emigration is not itself definitive in establishing the cost of human capital flight, consideration of emigrant demographics can determine the proportion of tertiary educated emigrants that take their education with them (Rallu 2008). Thus, for every year of education an individual undertakes, the amount of public expenditure vested in that education will be greater, thereby exacerbating the loss to that economy if the individual emigrates.

Figure 7 highlights the migrant population fluctuations within Latin America and East Asia. Although regional totals for tertiary qualified emigrants are unavailable, the emigration rate of trained physicians proves somewhat effective in gauging the underlying rate. The data appears to demonstrate that the investment made in education for developing human capital is retained slightly more effectively in East Asia than it is in Latin America. Although emigration from Hong Kong and Singapore does stand out, it is alleviated by the much higher level of immigration. By comparison, Latin America demonstrates greater emigration than immigration in all sample countries.

*Figure 7: Migrant Population Fluctuations and the Emigration Rate of Tertiary Qualified Individuals**

Region	Country	Emigrants as a % of population	Immigrants as a % of population	Emigration rate of physicians trained in the region %	Emigration rate of tertiary educated population
East Asia	Total region	1.1%	0.3%	1.4%	*
	China	0.6%	0.1%	0.2%	3.8%
	South Korea	4.3%	1.1%	5.4%	5.6%
	Japan	0.6%	1.7%	0.9%	1.2%
	Hong Kong	10.2%	38.8%	30.4%	28.8%
	Indonesia	1.1%	0.1%	1.4%	2.1%
	Singapore	6.1%	40.7%	15.5%	15.2%
LATAM	Total region	5.2%	1.1%	5.0%	*
	Argentina	2.4%	0.0%	2.9%	2.5%
	Bolivia	6.8%	1.5%	5.1%	5.8%
	Brazil	0.7%	0.4%	0.6%	2.2%
	Chile	3.7%	1.9%	5.1%	6.1%
	Colombia	4.6%	0.2%	5.7%	10.4%
	Ecuador	8.3%	2.9%	2.7%	9.5%
	Mexico	10.7%	0.7%	8.5%	15.3%

**Total region emigration of tertiary educated population is unavailable. As such, emigration of physicians can provide an indicative rate.*

**Based on World Bank 2011d*

This bias towards higher education emigration from Latin America is further indicated by Pellegrino (2002), who observes Mexico's unskilled or low skilled workers typically migrating to the United States, whilst South American unskilled workers may migrate intra-regionally depending on availability within labour markets. It is generally the middle class in Latin America who will migrate to Europe, North America and Australia, draining the region of human capital and the public spending benefits of education (Pellegrino 2002).

7. CONCLUSION

In considering the lack of economic growth experienced in Latin America, one cannot ignore the influence of education on the endogenous growth model. The quality of education has become indicative of the worth of a labour force, a key determinant in economic productivity. As such, if an economy covets economic prosperity, it must instil its people with both the desire and requisite knowledge to succeed in economic competition within the world arena.

Despite its financial and political efforts in educational reform, Latin America continually fails to replicate the East Asian formula for improving education in developing regions. Internationally standardised cognitive testing consistently shows Latin America at the lower end of the spectrum, whilst East Asia continues to enjoy its position at the higher end. Moreover, Latin America has a much greater negative migration rate than East Asia, including a higher proportion of tertiary qualified emigrants, restricting its ability to accumulate and maintain its own human capital.

What has become evident from this paper is that economic growth and success is predicated on the knowledge and skills of an effectively educated labour force. This is the key determinant that separates the economic growth of Latin America from East Asia. In essence, Latin America's failure lies largely with the quality of its labour, its human capital. Fortunately, with time and careful analysis of the education offered by more successful regions, Latin America will be able to reform, and finally experience sustained positive economic growth.

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The Economics of Marriage in China: How hukou and migration systems leave rural China men single

Yunxiu Kang, Mazni Hanis Mahfuz and Liangzhuo Yuan

dpibe

ABSTRACT

Contrary to a view that the number of unmarried women in the world is increasing due to the extinction of 'good' men, China today faces the converse:

More than 24 million Chinese men of marrying age could find themselves without spouses in 2020... Another researcher quoted by the newspaper, Wang Yuesheng, said men in poorer parts of China would be forced to accept marriages late in life or remain single for life...

~Discovery News (2010)

This paper focuses on the economic analysis of the impact of migration and the hukou system on the increased number of unmarried men in rural areas. We find that due to cultural issues as well as comparative advantage in home production versus income earning, women are more likely to leave rural areas of China.

1. INTRODUCTION

Statistics from the US Central Intelligence Agency show that in China, there are 106 men for every 100 women. In some rural areas of China the male-female ratio is as high as 130 men for every 100 women (Discovery News, 2010).

The mean age of marriage in China is increasing from 22.4 in 1982 to 23.3 in 2000 for women and 24.9 in 1982 to 25.1 in 2000 for men (United Nations Population Division, 2009). On the other hand, the portion of married men is lower compared to women with 91.3% of women in the age of 25-29 married compared to only 75.3% of men in the same range of age (United Nations Population Division, 2009).

Mc Kinsey & Co. in their report entitled “Preparing for China’s Urban Billion” indicated that approximately 103 million Chinese people migrated from rural to urban areas and estimated over 350 million people will add to the urban population by 2025 with internal migrants consisting of more than 240 million.

The hukou system is an essential household registration permit, like an internal passport. Each Chinese citizen is given a rural (agricultural) or urban (non-agricultural) hukou since 1950s. Only local hukou holders can receive local public services, such as social security, benefits and welfare that are all covered by local government budget, which means the difference of benefits can be significant across regions (Cheng 2010). A rural person who works in one city for his whole life may never be able to access city-level social benefits.

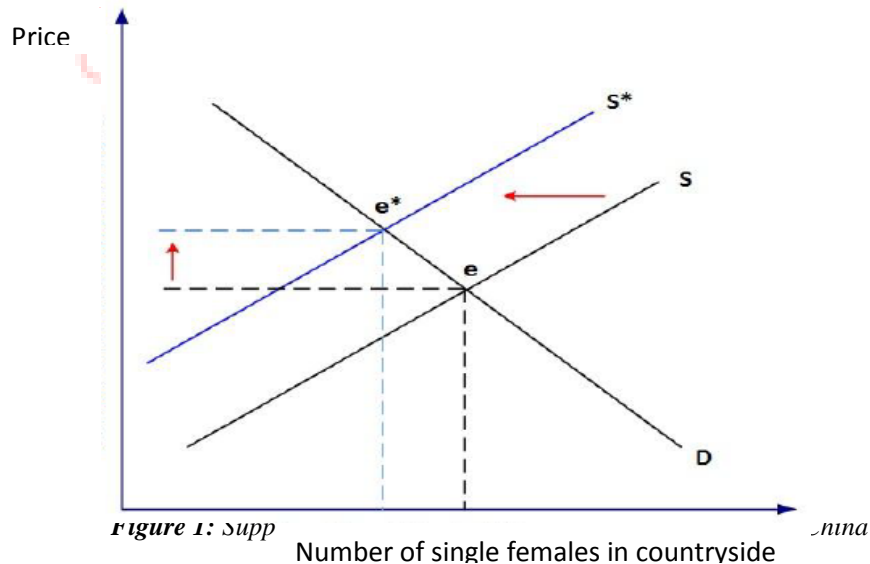
Hukous from different cities are valued differently. In Richburg’s (2010) article, he states that the Beijing hukou is the most prized. An urban hukou means individuals can have better opportunities in choosing jobs and education as well as receiving social-welfare facilities. The social benefits related to the hukou depend on the state of the local economy. Since the reform and open policy from 1970s, the economic gap between cities (especially coastal cities) and the rural areas has grown wider. This means that a city hukou is more attractive to the rural person than before.

Since government subsidies are a scarce resource, it is quite difficult for a person to exchange a rural hukou for an urban one. One feasible way for most rural females is to marry individuals with city hukous. Inter-hukou marriage is becoming increasingly common. In 2005, the probability that an urban boy marrying a rural girl increased by over 5% after 1998

(Nie and Xing, 2010). In the same time, the probability of a rural man marrying an urban woman hasn't changed by much. In addition to the preference for boys in China, the net 'export' of rural girls to the cities worsened the imbalance of the sex ratio in rural areas. However, according to traditional Chinese culture, boys must take care of their parents and receive the inheritance of land. Based on the law of China, only the rural hukou holders can own land. That's why rural males are not willing to give up their rural hukou rights.

2. ECONOMIC ANALYSIS

The marriage market is a highly competitive market and due to the gender gap, women hold the power to choose (China Economist, 2011). Assume the demand curve represents the price a rural man has to pay to get a wife and the supply curve represents the supply of single (and willing) women in rural areas.



The migration of females from rural areas to the big cities has led the shift of supply curve to the left. This increases the equilibrium price from e to e^* which indicates a rise in the ‘price’ of females. Women in China are also becoming more highly-educated and financially independent. To adjust to this situation, men have to work harder, earn more money and increase their self-value to capture a woman’s heart.

The opportunity cost if a woman chooses a city man over a rural man is giving up the previous social life as she has to adapt to the city’s environment and lifestyle. Adapting to the city’s hectic environment may be challenging and if she is not prepared mentally and psychologically, this may lead to stress. This can be represented with the production possibility frontier (PPF) below. We assume that in order for a woman to receive more money or social identity, she has to give up certain amount of ‘love’. To earn more money, more time needs to be spent for work which means less time is spent together. ‘Love’ in this case refers to the time spent together between a married couple.

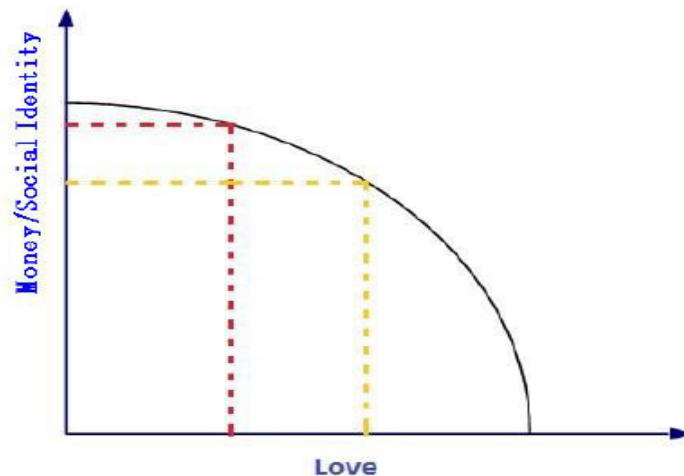


Figure 2: Production possibility frontier

According to traditional Chinese values, the man is responsible for maintaining the whole family; meanwhile the woman is responsible for housework (Hays 2008). We restrict our focus on the material life of a family, which consists of family income and housework. Let us say, we divide the whole Chinese population into four groups, namely, 1) urban male, 2) urban female, 3) rural male and 4) rural female. From a purely income perspective, we can see the income gap from the table below:

Income gap decomposition	Males	Females
<i>Before correction for sample selection bias</i>		
Geometric mean of urban income, $\tilde{W}_u = e^{\hat{\beta}_u \bar{X}_u + \hat{\gamma}_u \bar{\lambda}_u}$ (yuan)	207	154
Geometric mean of rural income, $\tilde{W}_r = e^{\hat{\beta}_r \bar{X}_r + \hat{\gamma}_r \bar{\lambda}_r}$ (yuan)	104	77
Relative income, $R = \tilde{W}_u / \tilde{W}_r$	1.99	2.00

Source: http://www.cerium.ca/IMG/pdf/Zhu_The_Impacts_of_Income_-_China_economic.pdf

Economically speaking, the urban male group specialises in making money (207 Yuan per month) among the four groups. Meanwhile rural females who have less access to education have to stay at home and focus on housework. In contrast, urban females generally receive more education recourses and job opportunities than rural females; they therefore spend less time on housework. That is the reason why rural females specialise in housework. So that means when an urban male marries a rural female, the gains from the marriage will be relatively higher. The three graphs below show the gains from an inter-hukou marriage (urban male and rural female) are more than an intra-hukou marriage.

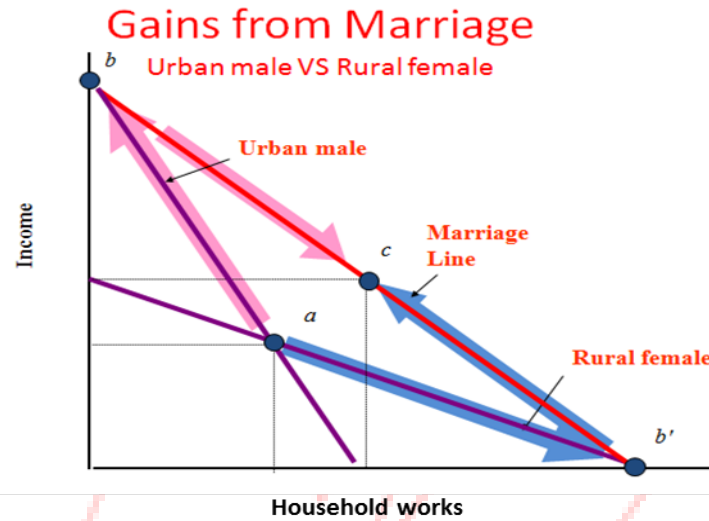


Figure 3: Gains from marriage (Urban male and Rural female)

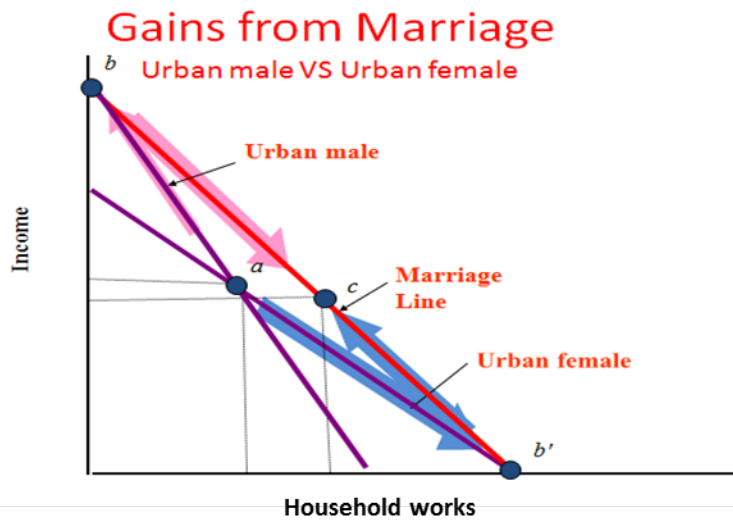


Figure 4: Gains from marriage (Urban male and Urban female)

The last possibility is that an urban female marries a rural male. However this situation is least common because from a Chinese culture aspect, females always want to find a male with better social status and stronger financial background. Moreover, from economic aspect, the gains from specialisation in marriage will not be as large since rural males will still command decent economic opportunities.

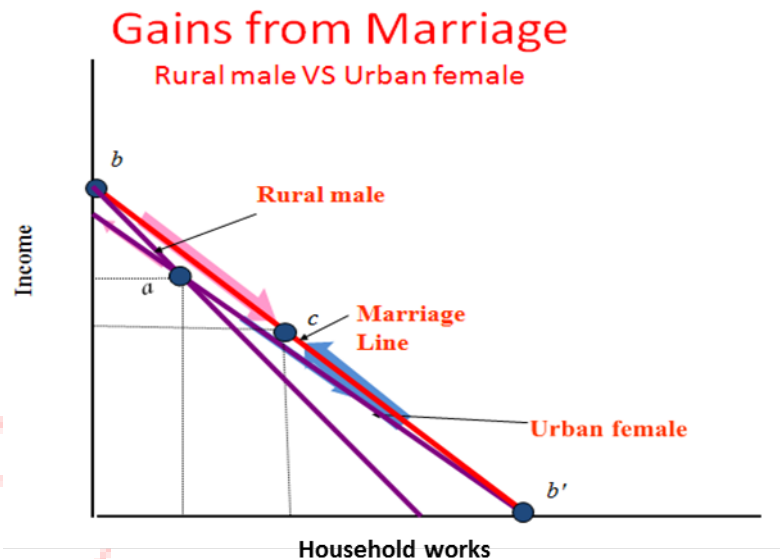


Figure 5: Gains from marriage (Rural male and Urban female)

3. GOVERNMENT INTERVENTION

To control the migration level and hukou system, the government of China has amended the policies. The hukou system has becoming more difficult to get in some big city like Beijing, Shanghai etcetera, as recent reforms often contain high income and strict housing requirements (Congressional-Executive Commission on China 2005). This includes “to qualify, applicants must have held a temporary Shanghai residency certificate and have been in the city’s social insurance program for at least seven years, must be taxpayers, have

obtained vocational qualifications at intermediate to high levels, and worked in pertinent fields, must have clean credit and criminal records” (Cheng 2010).

Furthermore, the government of some of the biggest cities like Beijing and Shanghai restrict marriage migration. They impose a series of extremely high requirements for an urban male who wants to transfer his wife from an agriculture hukou to urban hukou. The urban male needs a master degree with three years working experience or has to be a technician in a high-tech company or has to have a bachelor degree with a major in IT, telecommunications or an intermediate professional title (Cao 2009).

In order to decrease the imbalance of the gender gap, some modern cities have been encouraging young people who only have one child in the family to have a second child. Shanghai is taking its first step to reverse the one-child policy (Elegant 2009). This process is to reduce the proportion of the aging people and improve workforce scarcity in the future (Elegant 2009). There would be more urban males and females, which also means there will be decreasing demand for ‘importing’ rural females, and hence a reduction in the gender gap in rural areas.

4. CONCLUSION

The city hukou offers better prospects for jobs, health, education and social-welfare facilities (as per Appendix A). Those who have them also enjoy more government subsidies and facilities than individuals with a rural hukou. It is quite difficult for a person to change from a rural hukou to an urban hukou. There are some requirements such as a high education background, important tax contributions to the city government, or a specialist in one’s field. One of the most feasible ways is for a rural individual to migrate and marry a city individual. Because of culture and the economics of specialisation, the most likely scenario is where a rural woman migrates by marrying an urban man.

The Chinese government has revised the hukou and inter-hukou marriage policy in order to balance the gender gap. The government is also currently encouraging every family to have more than one child to improve the workforce scarcity and at the same time to close the gender gap in the future. With these government interventions, the number of unmarried rural males may decline to a more balanced level in the future.

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Appendix A

Table A1: Net Female Migration by Province and Provincial Characteristics

Province	Net Female Marriage Migrants (1995-2000)	GDP Per Capita (2006)		Dependency Ratio (2006)	Percent Rural (2006)	Life Expectancy at Birth (2000)	Percent of Males 30+ Never Married* (2030)
		Nominal	Quintile				
Jiangsu	176,000	33,928	1	12.4	48.1	73.9	6.14%
Guangdong	99,000	33,151	1	8.9	37.0	73.3	5.67%
Zhejiang	96,000	37,411	1	12.2	43.5	74.7	7.58%
Shandong	65,000	27,807	2	11.4	53.9	73.9	6.33%
Beijing	62,000	58,204	1	10.8	15.7	76.1	3.13%
Liaoning	43,000	25,729	2	10.6	41.0	73.3	5.92%
Shanghai	42,000	66,367	1	15.0	11.3	78.1	3.98%
Tianjin	30,000	46,122	1	11.2	24.3	74.9	4.60%
Hebei	29,000	19,877	2	10.0	61.6	72.5	6.73%
Xinjiang	26,000	16,999	3	6.9	62.1	67.4	8.44%
Fujian	22,000	25,908	2	9.5	52.0	72.6	8.09%
Shanxi	13,000	16,945	3	9.3	57.0	71.7	6.38%

Source: http://pluto.huji.ac.il/~ebenstein/DasGupta_Ebenstein_Sharygin_Marriage_January_2011.pdf

Table 4: Legal minimum wage by selected Chinese cities, as of August 2010

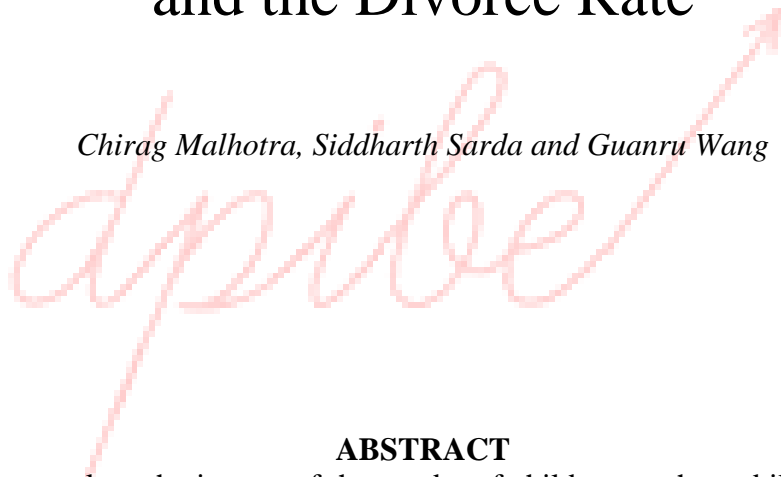
	Wage (RMB/month)
Chengdu, Sichuan Province	450 or 550 or 650 [location-specific]
Zhengzhou, Henan Province	600 or 700 or 800 [location-specific]
Chongqing	680
Taiyuan, Shanxi Province	850
Beijing	900
Langfang, Hebei Province	900
Wuhan, Hubei Province	900
Tianjin	920
Yantai, Shandong Province	920
Kunshan, Jiangsu Province	960
Hangzhou, Zhejiang Province	1,100
Shenzhen	1,100
Shanghai	1,120

Source: China's Ministry of Human Resources and Social Security, 2010.

Source: <http://japanfocus.org/-Jenny-Chan/3408>

The Relationship between Children's Gender and the Divorce Rate

Chirag Malhotra, Siddharth Sarda and Guanru Wang



ABSTRACT

In this paper we analyse the impact of the gender of children on the stability of marriage. In order to analyse the issue we have conducted a survey with 40 people as well as utilised various economic theories such as the “father involvement hypothesis” (Morgan et al 1988), and Durkheim’s division of labour theory (1893). We conclude that having a male child can reduce the odds of divorce.

1. INTRODUCTION

This topic is intriguing primarily because the topic is as old as mankind itself. Previous studies have shown that the gender composition of a family's children – particularly, the presence of male child – reduces the chances of divorce. Using a survey and an economic interpretation, we analyse the channels in which this might operate. To explain the findings of our survey we use of the 'father-involvement' hypothesis by Morgan et al (1988). The hypothesis suggests that on average, the roles played by a father are greater with their male child and as a result they end up spending more time with their male child than with their female child. In turn the higher the level of a father's involvement in the marriage, the lower is the odds of divorce. However the same is not observed in women's involvement (White 1990). From an economic point of view the divorce rate is reciprocally associated with the specific investments made in a marriage by both the father and the mother. (Becker et al. 1977).

A father's presence and involvement during a child's raising may result in various types of division of labour amongst the family. Durkheim's (1893) theory says that fathers who have more presence during a child's rearing may result in the creation of an additional dependence amongst spouses. There will be an increased division of labour within the household, where husband and wife tend to be more reliant on the other to fulfil their economic function. This form of solidarity is called 'organic solidarity' by Durkheim because individuals with different functions and mentalities are contracting with each other. Taken together with Morgan et al's hypothesis, we can say that families with boys tend to exercise more organic solidarity (Diekmann & Schmidheiny 2002).

2. DEMAND FOR CHILDREN

Marriage is a market. People transact in it primarily because it can produce a benefit that other markets cannot; for instance, the benefits of having a family, a new life, living with the people you love and the development of positive emotions. If people invest and fail to get the expected returns, they may want a divorce. Since children are an important product of the marriage market, we begin the analysis by analysing the difference in the demand for

children across genders. An overall high demand for boys may increase the stability of a marriage that has many boys. Morgan et al's (1988) hypothesis would further suggest that fathers will have a stronger demand for boys.

In order to gauge demand for children according to gender, we conducted a survey of 40 people (10 married couples, 10 single males and 10 single females) with two questions. All of the subjects are aged between 21 – 35, are Australian residents and are not living with their parents. The married couples are working fulltime and the rest are students. The questions and relevant results are the following:

Question one

*What is the preferred gender for your child?**

Male (male/ female ratio)	Female (male/ female ratio)
27 (14/13)	13(6/7)

*Figures in brackets indicate the ratio of respondents according to gender

For the first question, 27 people prefer to have a male child (includes 14 male and 13 female) and 13 people prefer a female child to a male child (includes 6 male and 7 female).

The survey shows two points:

1. Firstly, the overall demand for male children is higher than the demand for female child. From a simple preference viewpoint, couples will be more satisfied with their marriage if they had a male child. From a Beckerian investment viewpoint, divorces should also be less likely.
2. Secondly, there seems to be little difference between the gender preferences of males and females, which both genders nearly equally represented in preference for both male and female children. Contrary to the Morgan et al (1988) hypothesis, men do not prefer to have boys.

Question two

*If your first child's gender does not satisfy your expectations, would you choose to have a second child?**

	<i>Yes</i> (want male child/want female child)	<i>No</i> (want male child/want female child)
<i>Male</i>	15 (11/4=2.75)	5 (3/2=1.5)
<i>Female</i>	11 (8/3=2.67)	9 (5/4=1.25)

*Figures in brackets indicate the ratio of respondents according to gender preferences

The table shows two points:

1. Firstly, men tend to a stronger preference for a child with their expected gender. As the data shows, the majority of men are willing to have a second child and the demand for boys are higher.
2. Secondly, people who want a male child are more willing to have a second child than people who want a female child. No matter male or female, the amounts for “want male child” are higher than the amounts of “want female child”. This result shows that people who want a male child are more likely to have a second child if the first child is female, supporting the findings from the first question.

The overview of questions 1 and 2 tell us that the demand for a male child is higher than the demand for a female child. In other words, most people invest in the market of marriage with a hope of getting the benefit of male child. Furthermore, men are more persistent in obtaining a child of their preferred gender, and they are even more so if they prefer a male child.

3. THE RELATIONSHIP BETWEEN CHILDREN AND PARENTS

Given that we have analysed demand, we now look at how children affect the relationship between a father and mother.

This part of the survey has eight questions and the results are as follows*:

<i>Question</i>	<i>Father</i>	<i>Mother</i>
1. Who do you prefer to share your secrets with?	10 (6/4)	30(14/16)
2. Who do you prefer to tell first when you make a mistake?	11 (5/6)	29(15/14)
3. Who do you protect/support more when your parents argue about something?	12 (3/9)	29(18/11)
4. Who do you prefer to play with?	19 (14/5)	21 (6/15)
5. Who do you prefer to work with?	26(16/10)	14 (4/10)

* Figures in brackets indicate the ratio of respondents according to gender

The data suggests that mothers have a closer relationship with both male child and female child than the father since the mother scores higher in all questions except preference for working (question 5). However, the Morgan et al (1988) hypothesis finds some support in question 4, where males tend to prefer to play with their fathers.

<i>Question</i>	<i>Father</i>	<i>Mother</i>
6. Who has more income?	31(18/13)	9 (2/7)
7. Who makes the final decision?	25(14/11)	15 (5/9)
8. Who controls the family financial matters?	16 (10/6)	24(10/14)

The presence of a child may influence a parent's enthusiasm in his/her career life as well. Question 6, 7 and 8 indicate that men are more likely to be the economic leader of a family when the child is male. However, when the child is female mothers tend to be the leader. It is

not clear which factor is causing the other. Additionally, the survey respondents may come from multi-children families.

One argument for why having a child which is the same gender as oneself may affect one's motivation to earn is found in 'common identity'. A mother may agree with her female child buying new jewellery, whereas the same may be the case when a father agrees with his male child buying a new car. The opposite-gendered parent may not emphasise as strongly with regards to consumption preferences. This increased consumption motivates the need for higher income of parents with the same gender as their child.

Many cultures are rooted in historical beliefs that men should make more money, contribute more and have an overall upper hand in the family, making women financially dependent on their husbands. Therefore in communities where this is true, a father's choice to be involved in the marriage has a huge overall effect on the success of the marriage.

In certain communities, the gender of a child plays a pivotal role in the level of education they receive and the narrowed down choice of occupation that he/she is likely to choose. Moreover, our data suggests that the gender of a child affects the behaviour of parents. Lundberg and Rose (2002) – data collected from USA – find that there was a hike in the wages and labour supply of men in response to the birth of male children. No differences in wages were noticed in that of women. Another research suggests a woman is more likely to marry the child's father after a nonmarital birth if the child is a son (Lundberg and Rose 2001).

4. THE COST OF DIVORCE

Despite so far discussing the benefits of having a male child and its link with the divorce rate, men may play a stronger role in determining the likelihood of divorce based on the economic /monetary consequences of divorce. Most men who opt for divorce are immediately financially better off as they preserve a significant labour earnings as they typically do not pay large amounts of alimony and/or child support to their ex-wives and on the other hand, women and children(s) implicated in separation are often much financially worse off. However growth in an ex-wife's income may be contributed from the new husband's labour

income if she remarries (Greg J. Duncan, 1985). In families where women are reliant on the men for financial support, men have a stronger role in determining the stability of marriage, therefore in turn explaining why a male child has a tendency to reduce divorce rates relative to a female child.

5. CONCLUSION

From our research we conclude that the demand for a male child is higher than for a female child. In addition, men are more persistent in acquiring a second child if the first child is female and female children are not their first preference.

Along the lines of the 'father involvement hypothesis' by Morgan et al (1988) we find that a child will tend to identify the same-gender parent as the leader of the family. This argument can also be used to understand why fathers tend to earn and invest more in a male child.

Overall, while one could argue that a daughter may increase a mother's involvement in a marriage, a father's involvement may be more influential on divorce probabilities due to men tending to have a higher income.

While most of the research work undertaken has been done in developed countries, a clear direction forward is the sensitivity of the results to cultural differences.

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