

# Human capital demand in Brazil: The effects of adjustment cost, economic growth, exports and imports<sup>☆</sup>

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## Abstract

The objective of this paper is to learn about the effects of the adjustment costs, economic growth, imports and exports on human capital labor demand. The dynamic model proposed by Sargent (1978) was adjusted to consider three types of human capital: (a) one with fundamental education (1–8 years of schooling); (b) one with secondary education level (9–11 years of education); (c) and one with tertiary education level (12 years or more of schooling). Using state level panel data, the dynamic econometrics estimates showed the following results: (i) the labor market adjustment costs are very higher; (ii) the adjustment cost for the human capital with intermediary education level is the highest one compared to the others; (iii) the states' economic growth favor those with superior education; (iv) the imports seems to favor the demand for those with intermediate education levels; (v) the degree of openness does show some weak effect on the demand for human capitals with intermediate education. In sum, the growing demand for human capital with some superior education seems to be more associated to its lower adjustment cost and economic growth; the non-significance of real wage elasticity and high adjustment cost seems to indicate that the human capital with intermediate knowledge is in short supply; hence, economic education policy that increases supply of such human capital are in need.

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## Resumo

O objetivo do artigo é o de avaliar os efeitos dos custos de ajustamento, do crescimento econômico, das importações e das exportações dos estados brasileiros sobre a evolução do mercado de trabalho. O modelo dinâmico proposto por Sargent (1978) foi ajustado para contemplar o mercado de capital humano: a) com conhecimento fundamental (1 a 8 anos de estudos); b) com conhecimento intermediário (9 a 11 anos de estudos); c) e com conhecimento em nível superior (12 anos ou mais de estudos). As estimativas econométricas dinâmicas demonstraram os seguintes resultados: i) que os custos de ajustamento (contratação) em geral são elevados nos estados brasileiros; ii) que os custos de ajustamento do capital com educação em nível intermediário é superior

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aos demais; iii) que o crescimento econômico dos estados favorece a demanda por capital humano com educação superior; iv) que as importações contribuem ainda que fracamente para com a demanda do capital humano com educação intermediária; v) que o grau de abertura econômica dos estados apresenta efeito muito fraco e instável sobre a demanda por capital humano com educação intermediária. Em suma, o crescente aumento relativo do capital humano qualificado com educação em nível superior parece estar mais associado ao seu menor custo de ajustamento (contratação); o custo de ajustamento e a insignificância da elasticidade do salário real do capital humano intermediário parecem indicar uma possível restrição de oferta do mesmo; considerando que, aumentos da demanda de capital humano intermediário favorecem a demanda pelos demais capitais humanos, portanto, políticas de formação de pessoas com educação intermediária devem ser incentivadas.

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*Palavras-chave:* Capital humano; custos de ajustamento; crescimento econômico; exportação e importação; estimativas dinâmicas; painel de dados dos estados; elasticidade intertemporal

## 1. Introduction

The labor market in Brazil during the period of 1997–2009 has changed quite substantially regarding the human capital distribution per level of education. For instance, individuals with schooling years between 1 and 8 years of education (fundamental education) lost participation in the market from 57.8% in 1997 to 41.3% in 2009. At the same time individuals with schooling between 9 and 11 years of education (secondary education) saw their participation to grow from 19.5% to 33.3%. The same happened for individuals with education above 12 years of schooling (some degree of tertiary education), their market participation jump from 8.7% to 15.9% in the same period.<sup>1</sup>

The labor market change can be credited in part to the supply growth of more educated labor. However, it is an equilibrium market and requires that demand responds in the same way as the growth in supply in order to have more educated individuals working in the labor market. Hence, this paper focuses on the demand side of the labor market equilibrium.

More specifically, this paper looks to three aspects of demand using state level dataset which are: (i) the adjustment costs; (ii) the economic growth; (iii) the import; and (iv) the exports. The objective is to understand the importance of these variables in the demand shift towards more educated workers. Another important aspect related to the demand shift is regarding the relative wages. Does it signal complementarity or substitutability between the groups of education levels in the labor market?

The reviewed literatures in this paper show that the relative growth of human capital with 12 years of schooling or more started during the 80s and 90s. In this period they observed three important economic aspects in their researches. First, economic policies at that time created incentive to physical capital imports, thereafter demanding more qualified works to operate them. Second, education policies fostered the growth of individuals with 11 years of schooling; their higher productivity, compared to the others, made them more attractive. Third, early estimates of hiring costs at industry level showed to be higher for individuals with lower fundamental education compared to the other groups.

One important finding in the reviewed literature is that the structural change made by the adoption of a new constitution in 1988 had no effect in the labor market dynamics. This is quite important since the labor cost changed very substantially with the new constitution of 1988.

As one may notice this paper complements the literature by looking to the role of new economic variables related to the development occurred at state level. More specifically, Brazilian states economies have been growing at different levels and the observed level of opening up are not the same. Therefore, they might influence labor market dynamics in a different way. At the same time education policy towards tertiary education are quite different among the states. Some depend heavily upon federal investments while others states like Sao Paulo and Parana have made this an important educational policy. By using panel data we expect to capture long run dynamics effects associated to economic and educational policies made at state level.

Also this paper will estimate the adjustment cost per group of education – fundamental, secondary and tertiary – and compare them using state level panel data. Is the adjustment cost one of the explaining factors behind the relative

<sup>1</sup> The data is from IBGE available at [www.ibge.ov.br](http://www.ibge.ov.br).

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