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Economic Liberalization and Rising College Premiums in Mexico: A Reinterpretation

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Summary. — Mexico's college premium rose in the 1990s. Studies employing structural decomposition analyses treat the college premium as the relative price of "skilled" to "unskilled" workers. They find that reallocations of labor across industries and occupations cannot account for rising college premiums, and often attribute them to widely observed trade-induced increases in skills demand within the manufacturing sector. In contrast, using a reduced-form decomposition that moves beyond a binary definition of skill and allows for inter-occupation wage differentials, we show that employment shifts across occupations and industries *can* account for the increase in the college premium. We link the rising premium, and differences in its trajectory by gender and cohort, to the growth of specific professions that produce services, not manufactured goods.

JEL classification — F16, O15, J21
Key words — skill premium, employment composition, trade liberalization, services, Latin America, Mexico

1. INTRODUCTION

Many developing economies that liberalized trade and Foreign Direct Investment (FDI) in the 1980s and early 1990s experienced an increase in the relative wages of skilled workers. This occurred even as the relative supply of skilled workers expanded, which implies that the relative demand for skilled labor grew. The simplest Heckscher–Ohlin thinking would have predicted declining relative demand for skilled labor since developing countries were expected to specialize in low skill products upon opening up to trade. A large literature has therefore emerged that asks why the demand for skills increased rather than decreased. This literature, in which Mexico is perhaps the most studied country, provides compelling evidence that the liberalization of trade and FDI policies increased the relative demand for skilled workers within the manufacturing sector (e.g., Feenstra & Hanson, 1997; Revenga, 1997; Robertson, 2004; Verhoogen, 2008). However, to what extent these trade-induced increases in demand for skills within the manufacturing sector are actually responsible for driving skill premiums up in the economy as a whole (i.e., including the nonmanufacturing sectors) remains an open question. We take up this question, using Mexican census data from 1990 and 2000, taking the wage-ratio of college to high-school graduates as our estimate of the skill premium.

We will begin by reviewing the evidence that rising demand for college graduates within manufacturing, or within sectors more generally, is central to the rise in the college-premiums economy-wide. We will argue that this evidence almost all comes from decompositions that split an estimate of the shift in relative skills demand into a "between-sector" and a "within-sector" component. The between-sector demand shift is the increase in relative skills demand imputed, under certain aggregation assumptions, from changes in the employment shares of occupations and industries of differing skill intensities. It is larger when employment shifts into sectors that typically hire more college graduates. The within-sector demand shift is simply the residual difference between the estimated demand shift and the imputed between-sector shift. [1] The imputed between-sector demand shifts are usually very small (Robertson, 2000, 2004), if not negative (Katz & Murphy, 1992; Kijima, 2006; Sanchez-Paramo & Schady, 2003), and this finding has led to the conclusion that some force acting within sectors is responsible for driving up the college premium economy-wide. The literature largely appears to assume implicitly that this indicates a role for the trade-induced increases in skills-demand observed within manufacturing (see Section 2).

We will then critique the aggregation assumptions underlying the above analysis. Most importantly, we note that workers reporting the same education level in different occupations possess different skills, and therefore earn different wage rates. The standard decomposition analyses ignore these differences between occupations. This permits skill to be treated as one-dimensional, and analysis to be carried out in terms of the "relative quantity" and the "relative price" of "skilled" labor. We show that in Mexico the standard aggregation assumptions are not empirically justifiable, casting doubt, *ex ante*,

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on structural (supply and demand) models of the skill premium.

Of course, even incorrect simplifying assumptions may be harmless if they do not affect the *ex-post* outcome of the analysis. We will therefore ask what happens when we drop the assumption that workers within education classes are broadly homogenous. Doing so requires us to treat the college premium simply as a summary statistic, and not as the relative price between two factors of production. We split the employee pool into groups (or "sectors") defined by their occupation and industry of employment, and note that the college premium is just the difference between the average log-wage of all the different groups of workers holding college degrees and that of all the different groups of workers holding high-school degrees. Under this more empirically conservative interpretation, it is natural, as is common with other inequality measures, to decompose it, and to decompose its change over time.

We will therefore use a reduced-form decomposition to examine, counterfactually, how the observed changes in sectors' employment shares over-time would have shifted the college premium, holding the wage and educational profiles of sectors constant. Intuitively, we will ask whether the college premium rose because structural transformations permitted more college graduates to shift from poorly paid professions (e.g., secretaries) to well-paid ones (e.g., managers). As we will see, these counterfactual between-sector shifts in the college premium track the actual shifts in the premium remarkably well. This is in stark contrast to the traditional approaches in which between-sector shifts explain very little of the increase in the college premium. Moreover, between-sector shifts using this reduced form decomposition explain differences in the trajectory of the college premium between genders and cohorts. It follows that large within-sector forces need not be assumed to explain most of the rise in the college premium.

We will then identify the key occupations and industries responsible for the increase in skill premiums. These are a small group of professional occupations that primarily produce services and not manufactured goods. Moreover the employment shares and relative wages of these service professionals both increased. This suggests that rising demand for professional services was the main driver of rising college premiums economy-wide, not trade- or technology-induced changes in skills demand within manufacturing.

This distinction is policy-relevant. If rising college premiums reflect trade- or technology-induced scarcities, then it may be appropriate to supply more technical education in order to equip workers to produce new tradable goods and master new technologies. On the other hand, if rising college premiums reflect rising demand for the same old better-paid professions, then bottlenecks in professional training become crucial for efficiency. Moreover, from a sociological perspective, encouraging more (and usually less socially advantaged) students to pursue technical education when the returns are increasingly in high-status professions risks entrenching differences between status groups.

We present our argument as follows: Section 2 reviews the literature on rising skill premiums focusing for clarity on the Mexican case. Section 3 introduces the data. Section 4 presents our methodological argument. Section 5 shows that the college premium increased, and that it increased faster for women than for men despite faster growth in the share of women with college degrees. Section 6 uses a standard shift-share decomposition to describe changes in the employment situation of educated workers. Section 7 applies a reduced form decomposition approach to account for trends in Mexico's college premiums. Section 8 concludes and provides directions for future research.

2. LITERATURE REVIEW

Mexico's rising skill premiums have been widely examined, usually in the context of its increased exposure to foreign markets. Mexico reduced its trade barriers in the late 1980s when it joined the GATT. It liberalized rules on FDI in manufacturing more incrementally beginning in the early 1980s, and gradually eased the requirements for the establishment of maquiladoras (factories that may import inputs to the manufacture of exports duty free). The implementation of NAFTA, over 10 years starting in 1994, eliminated tariffs on trade with Canada and the US, and committed Mexico to maintaining earlier unilateral liberalizations of FDI.[2] Skill premiums rose during 1985–94 (when the Tequila crisis hit) and stabilized for the rest of the 1990s (Robertson, 2000, 2004; Rojas, 2006). Generalizing somewhat, the initial run-up in skill premiums has been attributed to some mix of FDI and trade liberalization (Hanson, 2003), although debate continues regarding the specific mechanisms driving skill premiums and how to interpret the experience since 1994 (Esquivel & Rodríguez-López, 2003).

We now review literature on the causes of rising college premiums, arguing that the evidence that they were driven up economy-wide by within-sector shifts comes from the decompositions whose assumptions this paper examines, and that the literature has primarily used data on the manufacturing sector and focused on explanations related to trade and technology. We focus on the Mexican experience to contextualize our findings.

(a) *Evidence for within-sector demand shifts*

The evidence for the importance of within-sector demand shifts is of three varieties. First, several authors seeking evidence of labor reallocations consistent with the Stolper–Samuelson Theorem have found reallocations across manufacturing industries to be small (Feliciano, 2001; Hanson & Harrison, 1999; Revenga, 1997). This implies that the adjustments giving rise to the higher utilization of skilled workers in manufacturing occurred within industries, and rules out not only Stolper–Samuelson effects, but also Hicks-neutral sector-biased changes (Berman, Bound, & Griliches, 1994). Notwithstanding its implications for trade theory, this finding sheds no light on the reasons for changing wage-inequality outside manufacturing.

Second, skill intensity rose within most industries, even as the relative wages of skilled workers increased, implying rising demand for skilled labor within those industries. Evidence of within-industry increases in skills demand has been found in the maquiladora "industry" (Mollick, 2008), in manufacturing sub-sectors (Esquivel & Rodríguez-López, 2003), and in many industries not limited to manufacturing (Airola & Juhn, 2008; Cragg & Epelbaum, 1996). This is credible evidence that within-sector demand shifts occurred, but does not imply that they are necessary for explaining rising college premiums economy-wide.

The third type of evidence for important within-sector shifts comes from the application of two types of decompositions. Studies utilizing these decompositions have been unable to link rising college premiums to shifts of workers between sectors, and have therefore concluded that within-sector shifts must have been more important. A key contribution of this paper is to show that these approaches may be predisposed to reach this conclusion. We will therefore discuss the findings of studies applying these decompositions more fully in Section 4.