BANCO CENTRAL DE COSTA RICA

WORKING PAPER

Technological Differences in Costa Rica

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1 Introduction

In this paper, we study a model of production to infer patterns of technical change in Costa Rica. This contributes to the understanding of the growth process in Costa Rica and complements the productivity analyses available.

The production functions we analyze are nested constant elasticity of substitution (CES) functions. These allow us to estimate the elasticity of substitution between capital and labor, between types of capital (ICT and non-ICT), and between types of labor (low, medium and high-skilled). Preliminary results suggest that capital and labor have an elasticity of substitution close to one, which is close to a Cobb-Douglas specification. Additionally, the types of capital behave like substitutes, with a positive elasticity of substitution, and the types of labor behave like complements, with a negative elasticity of substitution.

The productivity estimates we infer imply that ICT capital has been more productive than non-ICT capital during most of our sample, but that edge has been narrowing in recent years. High and medium-skilled labor have been more productive than low-skilled labor, a result that is consistent over the years in the sample. The relative productivities we infer for capital and labor in the various industries vary considerably more, and are related to the non-linearities coming from the CES specification.

2 Data

For this project, we use the KLEMS database for Costa Rica. This was created as part of the LAKLEMS project, that is the Latin American chapter of the World KLEMS initiative (LAKLEMS, 2019). This project was initially financed by the Economic Commission for Latin America and the Caribbean, and later on, financed and coortinated by the Inter-American Development Bank.

In this section, we describe and present a brief analysis of the data we use in the econometric estimations. The main objective is to study long term trends. Similarly to Oulton (2016), we find high volatility in the data, so we base our analysis on a group of smoothed series.[1]

[1] For this, we used the Savitzky-Golay filter, considering 7 periods and a second degree polynomial. This does not affect the main results of the paper.

There is great heterogeneity in the industries studied, so analyzing the differences in their input usage and retribution is an important step in understanding the growth process in the country.

The KLEMS databases disaggregate the use and retribution of production inputs, considering nine different industries. This classification follows the third revision of the International Standard Industrial Classification of All Industries:

- Agriculture, hunting, forestry and fishing (Industry code AtB).
- Mining and quarrying (Industry code C).
- Manufacturing (Industry code D).
- Electricity, gas and water supply (Industry code E).
- Construction (Industry code F).
- Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods; hotels and restaurants (Industry code GtH).
- Transport, storage and communications (Industry code I).
- Financial intermediation; real estate, renting and business activities (Industry code JtK).
- Public administration and defence; compulsory social security; education; health and social work; other community, social and personal service activities (Industry code LtQ).

In this article, we focus on capital and labor as the sole inputs in production. The types of capital we consider are:

- ICT capital: Computer equipment, communication equipment and software.
- Non-ICT capital: transportation equipment, other machinery and equipments, non-residential buildings, residential buildings[2], cultivated assets, research and development, and other intellectual property products[3]

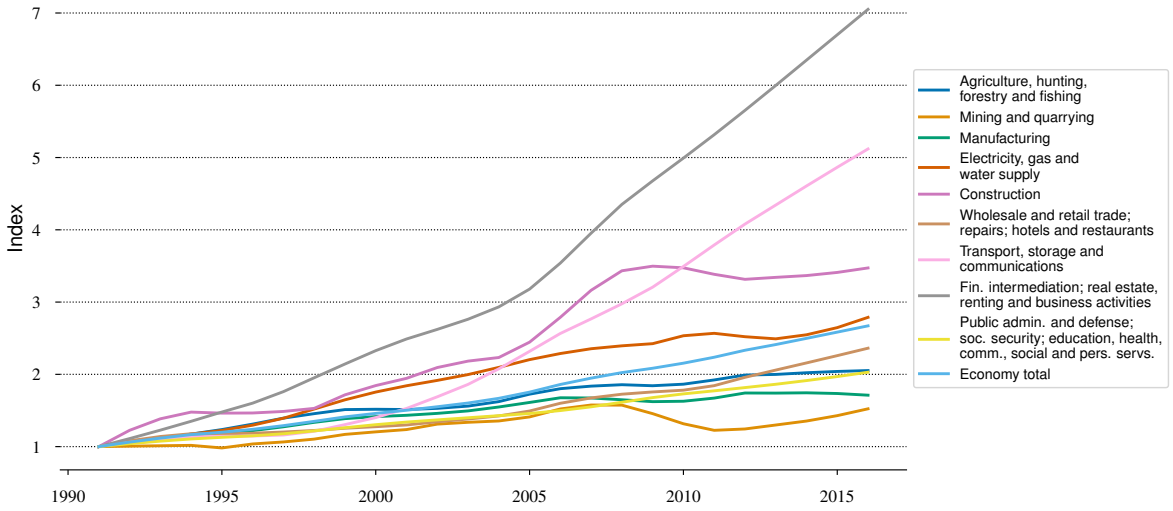
[2]In the Costa Rican National Accounting System, the value of the services of self-owned residences is imputed to the rental activities in the real estate sector.

[3]Land and natural resources are not measured as assets. This may affect the productivity estimates, particularly in industries such as agriculture and mining.

The types of labor we consider are:

- High-skilled labor: workers with college or technical education.
- Medium-skilled labor: workers with completed high school.
- Low-skilled labor: workers with completed elementary school.

Figure 1: Real Value Added Index by Economic Activity

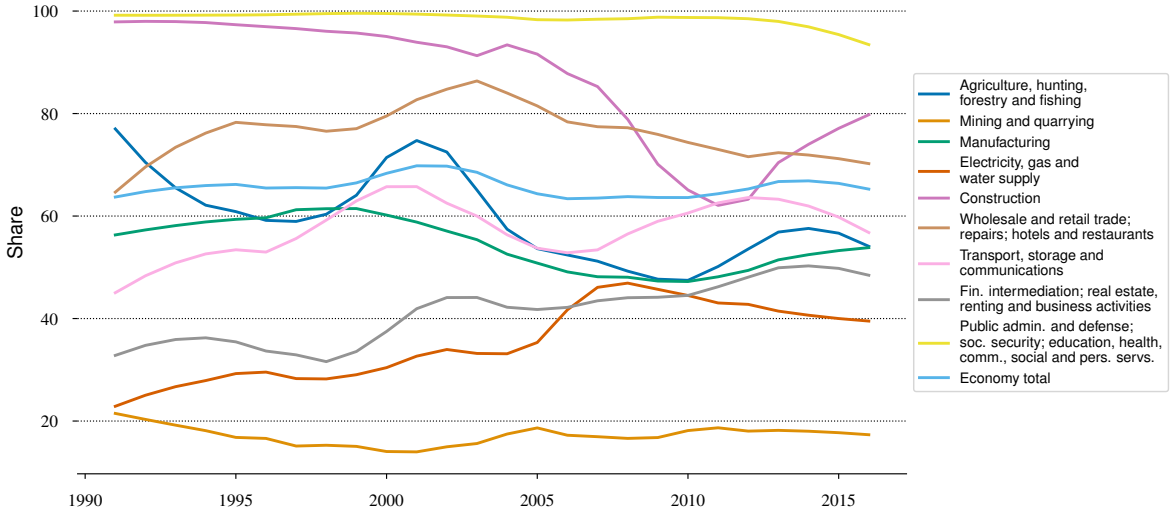


Between 1991 and 2016, all industries grew at positive rates, which can be seen in Figure 1. Overall, the economy grew at an average 4% on a yearly basis. The industries that grew the most were financial intermediation, real estate, renting and business activities (8.1%), transport, storage and communications (6.7%), and construction (5.1%).

The industries that grew the least were mining and quarrying (1.7%), manufacturing (2.2%), and public administration and defence, community, social and personal service activities (2.9%). During these years, most industries grew at positive rates. Due to the financial international crisis, many of these decelerated their growth rate. Mining, quarrying and construction were the most affected.

We now turn the focus to input payments. Initially, we'll study the labor share in each industry. We're excluding intermediate inputs, so our output measure is value added. The labor

Figure 2: Labor share as percentage of value added by industry

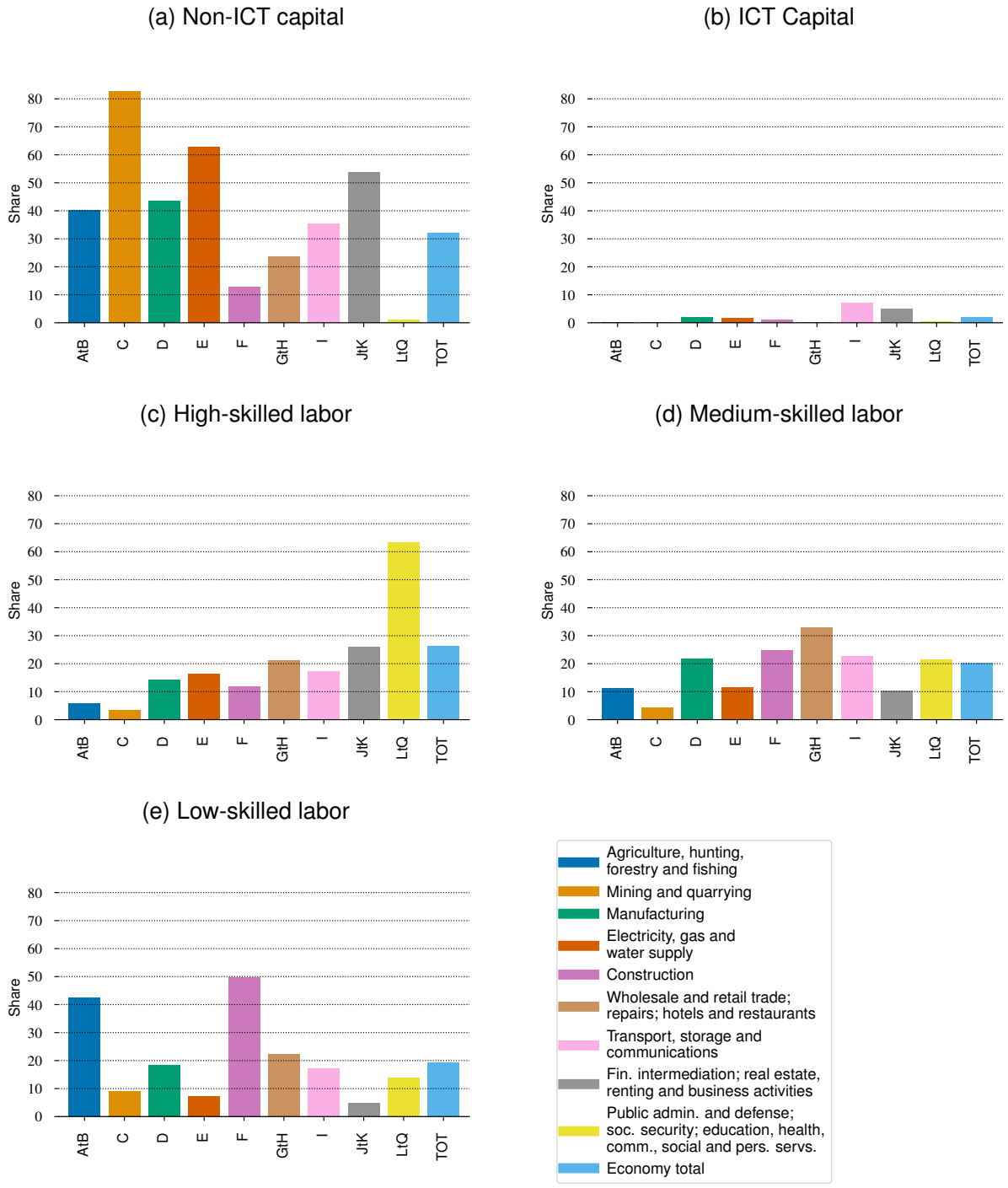


shares vary widely, as can be seen in Figure 2. The overall share shows a relatively constant level of 65.7%. Behind that figure, there are industries such as public administration and defence, community, social and personal service activities that operate almost entirely on labor, while industries like mining and quarrying operate mostly with capital. There are industries that have become more intensive in capital, while others have become more intensive in labor. Agriculture, hunting, forestry and fishing, along with construction, have become more capital intensive: both have decreased their capital share by 20 percentage points. Electricity, gas and water supply, alongside financial intermediation, real estate, renting and business industries have become more labor intensive: their labor shares increased by 18 and 16 percentage points.

Using information available in the KLEMS database, we can also break down payments to production factors. This is shown in Figure 3, where each bar points out the average compensation share of all five production inputs, by industry. For the total of the economy, non-ICT capital has the highest share, followed by high, middle and low-skilled labor, and ending with ICT capital.

There is a wide variety of productive structures: most industries made large payments to non-ICT capital. Hunting, forestry and fishing as well as construction use more low-skilled

Figure 3: Average input shares as percentage of value added by economic activity



Average production factors payment between 1991 and 2016.

labor. Wholesale and retail trade, hotels and restaurants that employ mainly medium-skilled labor, while high-skill labor is mainly employed by social community and personal services. The remaining industries have a higher non-ICT capital share. Therefore, we conclude that industries employ different technologies in their production process. In the next section we present the model that we use to understand these technological patterns in production.

3 Model

This model aims to reproduce the productive structure of Costa Rica, in order to infer information about the technological differences among industries. The production technology is represented by a nested constant elasticity of substitution (CES) function. This section describes the production structure. The goal of this section is to describe the economic environment and describe the key relations that will allow us to estimate the parameters and variables of interest.

In this economy there are I industries (denoted by i). Nominal value added in period t is given by

$$P_{i,t}Y_{i,t} = P_{i,t}\left[\left(A_{\tilde{K},i,t}\tilde{K}_{i,t}\right)^{\rho} + \left(A_{\tilde{L},i,t}\tilde{L}_{i,t}\right)^{\rho}\right]^{1/\rho} \tag{1}$$

where $P_{i,t}$ is the nominal price, $\tilde{K}_{i,t}$ and $\tilde{L}_{i,t}$ are the inputs of production: capital and labor. $A_{\tilde{K},i,t}$ and $A_{\tilde{L},i,t}$ are productivities linked to these inputs (that vary according to each industry), and $1/(1-\rho)$ is the elasticity of substitution (that does not vary by industry).

There are M types of capital (denoted by m), that are aggregated according to another CES funcion. This composite level of capital is given by

$$\tilde{K}_{i,t} = \left[\sum_{m=1}^{M}\left(A_{K,m,t}K_{i,m,t}\right)^{\xi}\right]^{1/\xi} \tag{2}$$

and it depends on the quantity of capital of type m in industry i, $K_{i,m,t}$, on the productivity related to capital of type m, $A_{K,m,t}$ (which is independent of industry i), and on the elasticity of substitution between types of capital, $1/(1-\xi)$.

On the other hand there are also N types of work (denoted by n), that are added according

to other CES function to obtain the composite level of labor

$$\tilde{L}_{i,t} = \left[\sum_{n=1}^{N} \left(A_{L,n,t} L_{i,n,t} \right)^{\eta} \right]^{1/\eta} \tag{3}$$

this depends on the quantity of labor of type n in industry i, $L_{i,n,t}$, on the productivity related to labor of type n, $A_{L,n,t}$ (which is independent of industry i), and on the elasticity of substitution between types of labor, $1/(1-\eta)$.

Firms are price takers in the input and output markets, therefore they face exogenous prices. They hire labor and rent capital each perdiod, consequently their optimization problem is static. For the firms in industry i, the problem is as follows

$$\max_{\left\{ \{K_{i,m,t}\}_{m=1}^{M}, \{L_{i,n,t}\}_{n=1}^{N} \right\}} P_{i,t} Y_{i,t} - \sum_{m=1}^{M} R_{i,m,t} K_{i,m,t} - \sum_{n=1}^{N} W_{i,n,t} L_{i,n,t} \tag{4}$$

where $R_{i,m,t}$ is the rental rate of capital of type m for industry i, and $W_{i,n,t}$ are the wages for industry i for labor of type n. These rates vary according to each industry because of the presence of different productivities; wage and rental equalization does not take place in this model.

The optimality conditions imply that payment to production factors are the following:

$$R_{i,m,t} K_{i,m,t} = P_{i,t} Y_{i,t}^{1-\rho} A_{\tilde{K},i,t}^{\rho} \tilde{K}_{i,t}^{\rho-\xi} A_{K,m,t}^{\xi} K_{i,m,t}^{\xi} \tag{5}$$

$$W_{i,n,t} L_{i,n,t} = P_{i,t} Y_{i,t}^{1-\rho} A_{\tilde{L},i,t}^{\rho} \tilde{L}_{i,t}^{\rho-\eta} A_{L,n,t}^{\eta} L_{i,n,t}^{\eta} \tag{6}$$

These are the relationships on which the statistical inference is based on. The following sections explain how we proceed.

4 Statistical inference

The parameters of the model are inferred from the optimality conditions (5) and (6). After applying logarithms, we obtain

$$\ln\left(\frac{R_{i,m,t} K_{i,m,t}}{P_{i,t} Y_{i,t}} \right) = \rho \ln\left(A_{\tilde{K},i,t} \right) + (\rho - \xi) \ln\left(\tilde{K}_{i,t} \right) + \xi \ln\left(A_{K,m,t} \right)$$

$$- \rho \ln\left(Y_{i,t}\right) + \xi \ln\left(K_{i,m,t}\right) \tag{7}$$

$$\ln\left(\frac{W_{i,n,t}L_{i,n,t}}{P_{i,t}Y_{i,t}}\right) = \rho \ln\left(A_{\tilde{L},i,t}\right) + (\rho - \eta)\ln\left(\tilde{L}_{i,t}\right) + \eta \ln\left(A_{L,n,t}\right)$$
$$- \rho \ln\left(Y_{i,t}\right) + \eta \ln\left(L_{i,n,t}\right) \tag{8}$$

Given these additive relationships, we could obtain elasticities and productivities by introducing dummy variables as follows:

$$\ln\left(\frac{R_{i,m,t}K_{i,m,t}}{P_{i,t}Y_{i,t}}\right) = \sum_{t=1}^{T}\sum_{i=1}^{I}\alpha_{i,t}^{K}\mathbb{I}(i,t) + \sum_{t=1}^{T}\sum_{m=1}^{M}\alpha_{m,t}^{K}\mathbb{I}(m,t) \tag{9}$$
$$+ \beta_Y \ln\left(Y_{i,t}\right) + \beta_K \ln\left(K_{i,m,t}\right) + \epsilon_{i,m,t} \tag{10}$$

$$\ln\left(\frac{W_{i,n,t}L_{i,n,t}}{P_{i,t}Y_{i,t}}\right) = \sum_{t=1}^{T}\sum_{i=1}^{I}\alpha_{i,t}^{L}\mathbb{I}(i,t) + \sum_{t=1}^{T}\sum_{n=1}^{N}\alpha_{n,t}^{L}\mathbb{I}(n,t) \tag{11}$$
$$+ \beta_Y \ln\left(Y_{i,t}\right) + \beta_L \ln\left(L_{i,n,t}\right) + \epsilon_{i,n,t} \tag{12}$$

where $\mathbb{I}(i,t)$, $\mathbb{I}(m,t)$ and $\mathbb{I}(n,t)$ are indicators for industry, capital type and labor type in each period. This is, we could include fixed effects for each period-industry and period-input type pairs (input type being the types of capital or types of labor), real output, and input quantities. Therefore, the structural interpretation of the coefficients would be as follows:

$$\alpha_{i,t}^{K} = \rho \ln\left(A_{\tilde{K},i,t}\right) + (\rho - \xi)\ln\left(\tilde{K}_{i,t}\right) \tag{13}$$

$$\alpha_{m,t}^{K} = \xi \ln\left(A_{K,m,t}\right) \tag{14}$$

$$\alpha_{i,t}^{L} = \rho \ln\left(A_{\tilde{L},i,t}\right) + (\rho - \eta)\ln\left(\tilde{L}_{i,t}\right) \tag{15}$$

$$\alpha_{n,t}^{L} = \eta \ln\left(A_{L,n,t}\right) \tag{16}$$

$$\beta_Y = -\rho \tag{17}$$

$$\beta_K = \xi \tag{18}$$

$$\beta_L = \eta \tag{19}$$

These equations allow us to obtain all the parameters and variables of interest. There is a downside, though: some variables are perfectly colinear ($\mathbb{I}(i,t)$ with $\mathbb{I}(n,t)$ and $\mathbb{I}(m,t)$,

as well as value added with industry-period fixed effects ($Y_{i,t}$ with $\mathbb{I}(i,t)$), which renders this specification unfeasible.

In order to recover the largest quantity of parameters from the model, a different approach must be followed. The approach we describe makes it possible to recover the productivities of different industries (associated to composite capital and labor), and relative types of capital and labor. This is the main objective of this study, therefore it does not represent a relevant limitation. In the transformed model, the equations to be estimated are

$$\ln\left(\frac{R_{i,m,t}K_{i,m,t}}{P_{i,t}Y_{i,t}}\right) = \sum_{t=1}^{T}\sum_{i=1}^{I}\gamma_{i,t}^{K}\mathbb{I}(i,t) + \sum_{t=1}^{T}\sum_{m\neq M}\gamma_{m,t}^{K}\mathbb{I}(m,t) + \beta_K \ln\left(K_{i,m,t}\right) + \varepsilon_{i,m,t} \tag{20}$$

$$\ln\left(\frac{W_{i,n,t}L_{i,n,t}}{P_{i,t}Y_{i,t}}\right) = \sum_{t=1}^{T}\sum_{i=1}^{I}\gamma_{i,t}^{L}\mathbb{I}(i,t) + \sum_{t=1}^{T}\sum_{n\neq N}\gamma_{n,t}^{L}\mathbb{I}(n,t) + \beta_L \ln\left(L_{i,n,t}\right) + \varepsilon_{i,n,t} \tag{21}$$

The difference is that in this case, one category for type of capital (M) and labor (N) are left out, as well as output, altogether. This makes it possible to identify the parameters of the equations. It also implies a different structural interpretation of the parameters:

$$\gamma_{i,t}^{K} = \rho \ln\left(A_{\tilde{K},i,t}\right) + (\rho - \xi)\ln\left(\tilde{K}_{i,t}\right) - \rho \ln\left(Y_{i,t}\right) + \xi \ln\left(A_{K,M,t}\right) \tag{22}$$

$$\gamma_{m,t}^{K} = \xi \ln\left(A_{K,m,t}\right) - \xi \ln\left(A_{K,M,t}\right) \tag{23}$$

$$\beta_K = \xi \tag{24}$$

$$\gamma_{i,t}^{L} = \rho \ln\left(A_{\tilde{L},i,t}\right) + (\rho - \eta)\ln\left(\tilde{L}_{i,t}\right) - \rho \ln\left(Y_{i,t}\right) + \eta \ln\left(A_{L,N,t}\right) \tag{25}$$

$$\gamma_{n,t}^{L} = \eta \ln\left(A_{L,n,t}\right) - \eta \ln\left(A_{L,N,t}\right) \tag{26}$$

$$\beta_L = \eta \tag{27}$$

These results allow to identify relative productivities, as opposed to the absolute productivities of the initial model. The estimation of (24) and (27) can now be interpreted directly as the parameters that determine the elasticities of substitution between types of labor and capital. Thus, the estimations of (23) and (26) make it possible to recover productivities for the types of capital and labor relative to the base categories, which are the ones excluded from the dummy variables:$A_{K,m,t}/A_{K,M,t}$ and $A_{L,n,t}/A_{L,N,t}$.

With the aim to extract more information from (22) and (25), some additional steps are required. Given that the functions aggregating the types of capital and labor are homogeneous of degree one, (2) and (3) can be rewritten as follows

$$\ln\left(\tilde{K}_{i,t}\right) = \ln\left(A_{K,M,t}\right) + \frac{1}{\xi}\ln\left[\sum_{m=1}^{M}\left(\frac{A_{K,m,t}}{A_{K,M,t}}K_{i,m,t}\right)^{\xi}\right] \tag{28}$$

$$\ln\left(\tilde{L}_{i,t}\right) = \ln\left(A_{L,N,t}\right) + \frac{1}{\eta}\ln\left[\sum_{n=1}^{N}\left(\frac{A_{L,n,t}}{A_{L,N,t}}L_{i,n,t}\right)^{\eta}\right] \tag{29}$$

Therefore, we can rewrite (23) and (26) in the following way

$$\gamma_{i,t}^{K} = \rho\ln\left(A_{\tilde{K},i,t}A_{K,M,t}\right) + \frac{\rho-\xi}{\xi}\ln\left[\sum_{m=1}^{M}\left(\frac{A_{K,m,t}}{A_{K,M,t}}K_{i,m,t}\right)^{\xi}\right] - \rho\ln\left(Y_{i,t}\right) \tag{30}$$

$$\gamma_{i,t}^{L} = \rho\ln\left(A_{\tilde{L},i,t}A_{L,N,t}\right) + \frac{\rho-\eta}{\eta}\ln\left[\sum_{n=1}^{N}\left(\frac{A_{L,n,t}}{A_{L,N,t}}L_{i,n,t}\right)^{\eta}\right] - \rho\ln\left(Y_{i,t}\right) \tag{31}$$

We can obtain from these equations the productivities of composite capital and labor multiplied by productivity of the base category. We need then an estimate of ρ. We assume that in industry I, $A_{\tilde{K},I,1}A_{K,M,1} = 1$, so that productivities that are inferred are relative to this point. And as our interest is the relative evolution across time this does not represent a serious constraint. Then we have

$$\rho = \frac{\gamma_{I,1}^{K} + \ln\left[\sum_{m=1}^{M}\left(\frac{A_{K,m,1}}{A_{K,M,1}}K_{I,m,1}\right)^{\xi}\right]}{\ln\left[\sum_{m=1}^{M}\left(\frac{A_{K,m,1}}{A_{K,M,1}}K_{I,m,1}\right)^{\xi}\right]\Big/\xi - \ln\left(Y_{I,1}\right)} \tag{32}$$

$$\ln\left(A_{\tilde{K},i,t}A_{K,M,t}\right) = \left\{\gamma_{i,t}^{K} + \frac{\xi-\rho}{\xi}\ln\left[\sum_{m=1}^{M}\left(\frac{A_{K,m,t}}{A_{K,M,t}}K_{i,m,t}\right)^{\xi}\right] + \rho\ln\left(Y_{i,t}\right)\right\}\Big/\rho \tag{33}$$

$$\ln\left(A_{\tilde{L},i,t}A_{L,N,t}\right) = \left\{\gamma_{i,t}^{L} + \frac{\eta-\rho}{\eta}\ln\left[\sum_{n=1}^{N}\left(\frac{A_{L,n,t}}{A_{L,N,t}}L_{i,n,t}\right)^{\eta}\right] + \rho\ln\left(Y_{i,t}\right)\right\}\Big/\rho \tag{34}$$

The structure of the model does not allow to split productivities $A_{\tilde{K},i,t}A_{K,M,t}$ y $A_{\tilde{L},i,t}A_{L,N,t}$ for each period, although it is possible to infer relative productivities for an industry I.

Therefore with this procedure we can identify

- ρ, that determines the elasticity of substitution between composite capital and composite

labor.

- ξ, that determines the elasticity of substitution between types of capital.
- η, determines the elasticity of substitution between types of labor.
- $A_{K,m,t} / A_{K,M,t}$, relative productivities between types of capital.
- $A_{L,n,t} / A_{L,N,t}$, relative productivities between types of labor.
- $A_{\tilde{K},i,t} / A_{\tilde{K},I,t}$, relative productivities between composite capital.
- $A_{\tilde{L},i,t} / A_{\tilde{L},I,t}$, relative productivities between composite labor.

5 Estimation strategy

Having described the identification strategy, we now turn to its estimation and argue that using weighted least squares is an appropriate approach. Moreover, we consider a variety of weights, with the goal of comparing their results and knowing how sensitive the results are to these choices.

The data at hand show different qualities throughout their gathering process. Some data was not accurately gathered because of poor administrative records, which have improved in Costa Rica over the years. Some data was not accurately grouped because of the changes in the ISIC conventions used. Some data was not accurately gathered because of the difficulty of separating categories that were not meant to be separated in the initial recording of the data. In some of the sectors, especially the smaller ones, measurement errors are more likely to significantly alter the overall results. This is the case for the labor statistics in Mining and quarrying, that is a small industry and relies on survey data to estimate the number of workers and their hours.

This suggests two principles that should be pursued when looking for a weighting scheme:

- More recent data is preferred.
- Larger sectors with robust data are preferred.

These KLEMS databases provide many ways to follow these principles, and in this project we evaluate the following weights:

- Production input (capital stock or worked hours) $\times$ Value added
- Production input
- Value added
- Value added share
- Input compensation share (capital or labor share)
- Production input share
- Production input $\times$ Value added share
- Input compensation $\times$ Value added share
- Value added $\times$ Production input share
- Value added $\times$ Input compensation share
- Equal weights

In principle, we have no way of knowing which of these weights is preferred. We will evaluate these according to how closely their results resemble each other's. Additionally, we shall study how stable the parameters are when the estimation window is shortened. This is, we take another variation in the estimation strategy and progressively discard older observations. This weighting scheme penalizes heavily older observations, and the goal is to know whether some of the estimates vary considerably.

6 WLS Elasticity Estimates

In this section, we evaluate the results of the various weighted least squares estimations. The initial focus is on the parameters ξ and η, that ultimately determine the elasticitiy of substitution between capital and labor, respectively. The point estimates using the full sample are:

Table 1: WLS elasticity estimates

	ξ	Capital elasticity of substitution	η	Labor elasticity of substitution
Production input $\times$ Value added	0.75	3.97	1.12	-8.12
Production input	0.74	3.88	1.11	-8.98
Value added	1.21	-4.75	1.04	-25.90
Value added share	1.18	-5.69	1.01	-111.63
Input comp. share	0.82	5.63	1.07	-15.18
Production input share	0.71	3.42	1.10	-9.71
Production input $\times$ Value added share	0.76	4.24	1.09	-10.61
Input comp. $\times$ Value added share	0.72	3.55	1.11	-9.03
Value added $\times$ Production input share	0.76	4.11	1.12	-8.65
Value added $\times$ Input comp. share	0.78	4.61	1.07	-14.12
Equal weights	1.19	-5.31	1.02	-46.72

In these results, most of the estimates of ξ are less than one, which imply a positive capital elasticity of substitution. Conditional on being positive, the average of these estimates is 4.28 with a standard deviation of 0.65. Conditional on being negative, their average and standard deviation are -5.25 and 0.39. Therefore, they show low dispersion, but more estimates show a positive capital elasticity of substitution.

Turning the attention to the estimates of η and their implied labor elasticity of substitution, all of these parameter estimates are larger than one, so all result in negative labor elasticity of substitution. The magnitude of these elasticities, however, vary importantly. The first group, made up by the five elasticities in the single digits, show an average of -8.90. The second group, made up by the five elasticities in the double digits, show an average of -22.51. The third group, made up by the estimate using the value added shares as weights, shows an implausibly large elasticity of substitution of -111.63. Therefore, it seems more plausible that the labor elasticity of substitution is in the single digit range, at around 9.

We shall now focus on the estimates when shortening the estimation window. The logic behind this analysis is to know whether these estimates are stable, and how closely these resemble the estimates coming from a more recent period with better information.

The weighting variable that leads to the most stable parameters is the product of the production input and the value added. It has the lowest standard deviation and the second lowest coefficient of variation among the alternatives in the equation related to labor compensation. It also has the second lowest standard deviation and coefficient of variation among the alternatives in the equation related to capital compensation. Therefore, this is our preferred weight, and the rest of the estimates will be based on this specification.

To identify the remaining elasticity of substitution between composite labor and capital, we need to make a normalization, as expressed in equation (32). Therefore, for completeness, we also consider all the possible results of these normalizations.

Most of these elasticity estimates are close to one. All but five normalizations result in elasticities above 0.9, with an average of 0.96. This means that the first level of the production function is close to a Cobb-Douglas specification, so that the differences in elasticities of substitution have more importance at the lower levels of the production process.

For the following estimates, we shall use the normalization coming from the capital com-

Table 2: Stability statistics for WLS elasticity estimates

	Labor elasticity of substitution		Capital elasticity of substitution	
	Standard deviation	Coefficient of variation	Standard deviation	Coefficient of variation
Production input × Value added	0.14	0.04	1.02	0.14
Production input	0.14	0.04	1.43	0.19
Value added	0.56	0.11	7.41	0.37
Value added share	0.55	0.10	152.37	1.60
Input comp. share	0.92	0.20	3.13	0.26
Production input share	0.25	0.06	1.70	0.22
Production input × Value added share	0.28	0.07	2.06	0.26
Input comp. × Value added share	0.19	0.05	0.98	0.12
Value added × Production input share	0.21	0.05	1.21	0.16
Value added × Input comp. share	0.41	0.10	2.55	0.22
Equal weights	0.16	0.03	17.74	0.64

Table 3: Capital-labor elasticity estimates by normalization equation

	Compensation equation	
	Capital	Labor
Agriculture, hunting, forestry and fishing	0.8630	0.9833
Mining and quarrying	0.9601	0.8649
Manufacturing	0.9290	0.9645
Electricity, gas and water supply	0.9760	0.9073
Construction	0.7073	0.9993
Wholesale and retail trade; repairs; hotels and rests.	0.8968	0.9748
Transport, storage and communications	0.9498	0.9554
Fin. intermediation; real estate, renting and business acts.	0.9677	0.9376
Public admin.; soc. security; social and pers. servs.	0.6786	0.9990

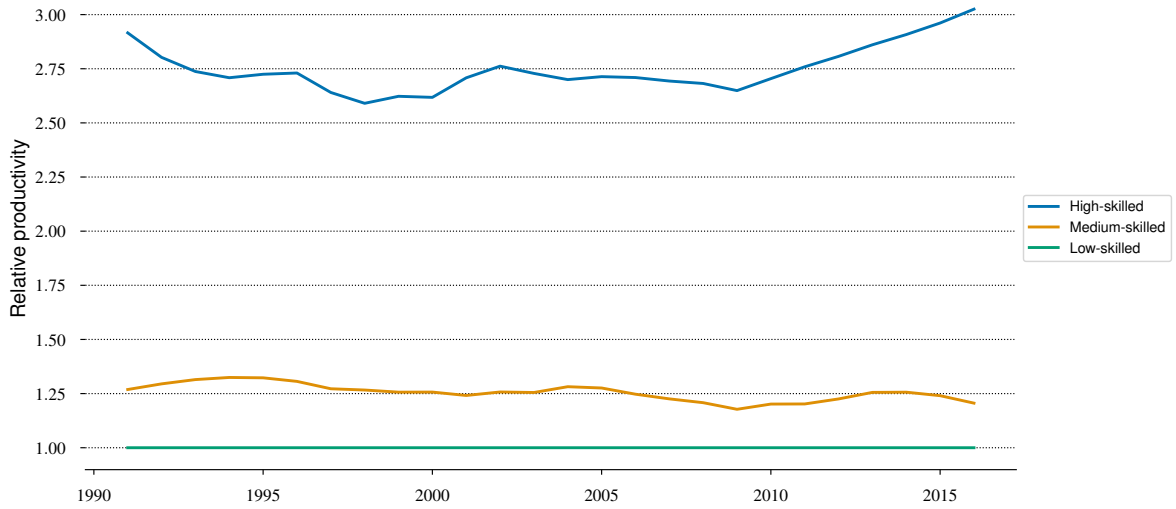
pensation equation in the manufacturing sector. Its level is the closest to the average of these elasticities, its value added is the largest one in 1991, and its labor share is close to the overall economy.

7 Productivity Estimates

The productivity estimates are backed out from the coefficients associated to numerous dummy variables. Because of their large amount, these are presented in the appendix. All of these are statistically significant, except the group of dummy variables associated with the productivity differences between ICT and non-ICT capital. These are significant at 10% only between 2006 and 2009.

The inferred relative productivities between types of labor are presented in Figure 4. These show that the relative productivities associated with medium and high skilled labor are relatively stable during this period, particularly the medium skilled. High skilled labor begins to increase in 2009.

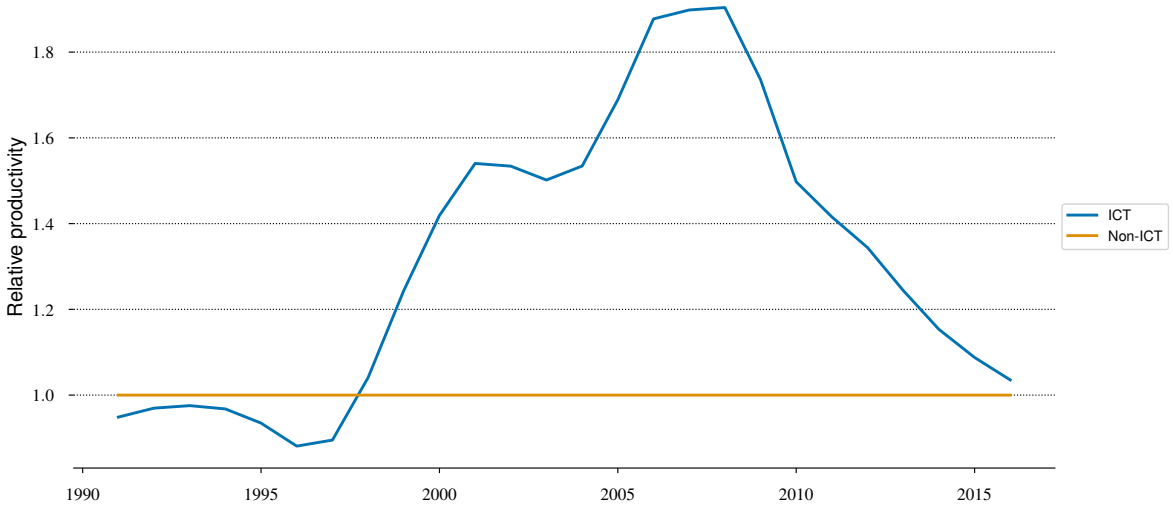
Figure 4: Relative productivity estimates for types of labor



The inferred relative productivity of ICT capital is presented in Figure 5. This shows that since 1999, ICT capital has a higher productivity than non-ICT capital. It peaks during 2008,

and almost reaches parity during 2016. Because of the closeness to 1 in many of the years, the associated coefficients are not statistically different from zero.

Figure 5: Relative productivity estimates for types of capital



The inferred relative productivities of composite labor and capital vary considerably more, reaching levels that are higher and lower in orderds of magnitude. In order to make their interpretation more comprehensible, the following figures present the relative productivities in logarithmic terms, base 10. Figure 6 presents the relative productivities of composite labor. The activities with higher relative productivity are Mining and quarrying, Electricity, gas and, water supply, and Financial intermediation. The activities with lower relative productivity are Wholesale and retail trade, Construction, and Public administration and defense. Agriculture and Transport fluctuate around Manufacturing's productivity.

The inferred relative productivities of composite capital are presented in Figure **??**. The activities that have the highest productivities are Public administration and Construction, and their gaps have closed over time. Wholesale and retail trade, and Agriculture fluctuate above Manufacturing, while Mining and Financial intermediation fluctuate below. Transport and Electricity have periods with higher and lower productivity.

Figure 6: Relative productivity estimates for composite labor

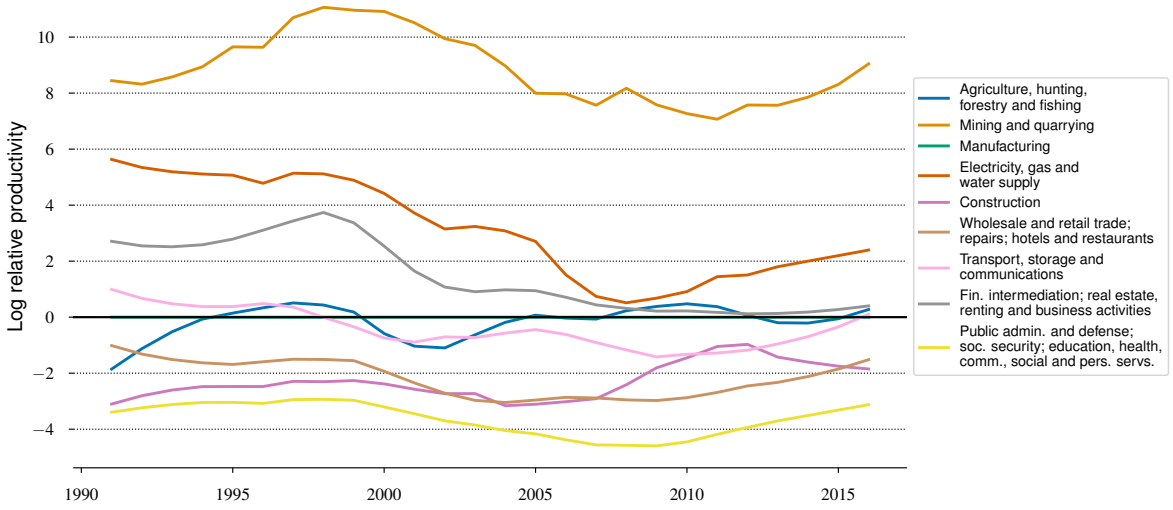
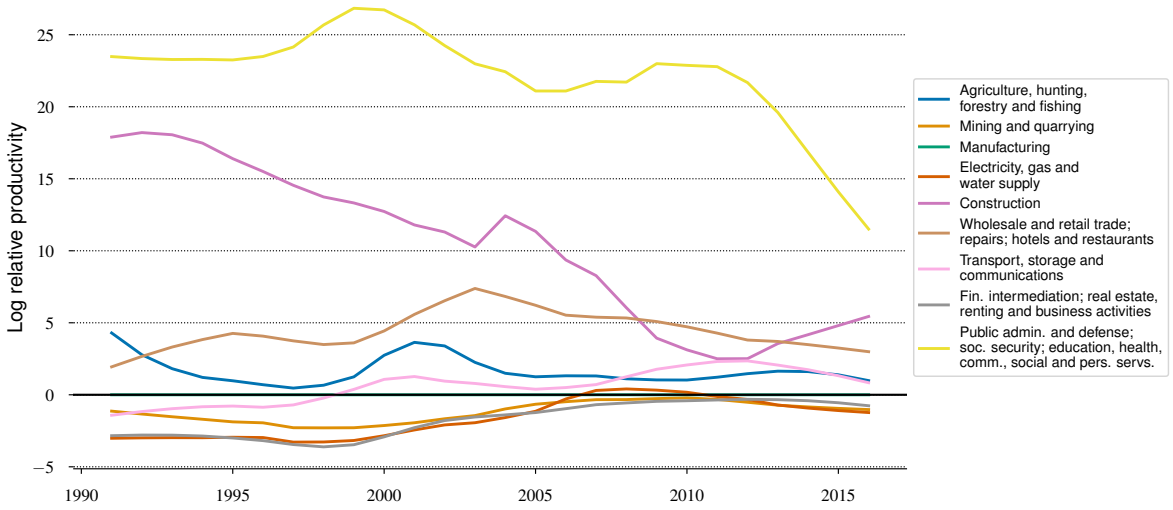


Figure 7: Relative productivity estimates for composite capital



8 Conclusions

In this paper, we take an initial study of the KLEMS database for Costa Rica. We observe large differences in their growth patterns, input utilization, and input compensation. To understand better the sources of these variations, we analyze a production model where the technology is

represented by a nested CES specification, and estimate it using weighted least squares.

Our estimates show that the elasticity of substitution between types of capital is 3.97. This means that ICT and non-ICT capital are substitutes in the production function, so that an increase in the relative price of one of these inputs increases their optimal marginal rate of substitution, and uses more of the type of capital that is relatively cheaper. Our estimates also show that the elasticity of substitution between types of labor is -8.12. This means that the types of labor behave more like complements, and increases in their relative prices induce decreases in their marginal rate of substitution. Moreover, the inferred elasticity of substitution between the composite levels of capital and labor is 0.92, which implies that the production function, at this level, is relatively close to a Cobb-Douglas specification.

The inferred relative capital productivities show that ICT capital grew in productivity during the first years of the sample, and started decreasing after 2008. The inferred relative labor productivities show that these have remained relatively stable over time, with a slight increase in high-skilled productivity towards the end of the sample. The relative productivities for composite capital and labor among economic activities show much larger differences than their non-composite counterparts. This is due to the highly non-linear production function imposed.

Further work includes incorporating more recent vintages of the KLEMS database. Additionally, further exploration of the drivers of growth; while this exercise has allowed for an estimation of relative productivities, their relative importance on growth figures remains to be quantified.

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Appendix A Estimation results

Table 4: WLS results for capital compensation equation

Dep. Variable:		lnRKshare		R-squared:		1.000
No. Observations:		468		Adj. R-squared:		1.000
Df Residuals:		207		F-statistic:		4810
Df Model:		260		Prob. F-statistic:		4.94e-324
Log-Likelihood:		-152.710		AIC:		827.400
Covariance Type:		nonrobust		BIC:		1910
	Coefficient	Std. Err.	t	P>|t|	[0.025	0.975]
dum_it_AtB_1991	-11.2973	0.6850	-16.4840	0.0000	-12.6480	-9.9460
dum_it_AtB_1992	-11.0591	0.6810	-16.2410	0.0000	-12.4020	-9.7170
dum_it_AtB_1993	-10.9176	0.6770	-16.1220	0.0000	-12.2530	-9.5830
dum_it_AtB_1994	-10.8395	0.6740	-16.0820	0.0000	-12.1680	-9.5110
dum_it_AtB_1995	-10.8226	0.6710	-16.1190	0.0000	-12.1460	-9.4990
dum_it_AtB_1996	-10.7999	0.6690	-16.1410	0.0000	-12.1190	-9.4810
dum_it_AtB_1997	-10.8212	0.6670	-16.2130	0.0000	-12.1370	-9.5050
dum_it_AtB_1998	-10.8900	0.6670	-16.3260	0.0000	-12.2050	-9.5750
dum_it_AtB_1999	-11.0241	0.6670	-16.5230	0.0000	-12.3400	-9.7090
dum_it_AtB_2000	-11.2886	0.6680	-16.8890	0.0000	-12.6060	-9.9710
dum_it_AtB_2001	-11.4436	0.6700	-17.0900	0.0000	-12.7640	-10.1230
dum_it_AtB_2002	-11.3840	0.6700	-16.9790	0.0000	-12.7060	-10.0620
dum_it_AtB_2003	-11.1654	0.6710	-16.6390	0.0000	-12.4880	-9.8420
dum_it_AtB_2004	-10.9849	0.6710	-16.3650	0.0000	-12.3080	-9.6620
dum_it_AtB_2005	-10.9179	0.6710	-16.2640	0.0000	-12.2410	-9.5940
dum_it_AtB_2006	-10.9130	0.6720	-16.2420	0.0000	-12.2380	-9.5880
dum_it_AtB_2007	-10.9088	0.6730	-16.2130	0.0000	-12.2350	-9.5820
dum_it_AtB_2008	-10.8871	0.6740	-16.1600	0.0000	-12.2150	-9.5590
dum_it_AtB_2009	-10.8648	0.6740	-16.1130	0.0000	-12.1940	-9.5350
dum_it_AtB_2010	-10.8679	0.6750	-16.1100	0.0000	-12.1980	-9.5380
dum_it_AtB_2011	-10.9350	0.6750	-16.1960	0.0000	-12.2660	-9.6040
dum_it_AtB_2012	-11.0354	0.6770	-16.3110	0.0000	-12.3690	-9.7020
dum_it_AtB_2013	-11.1332	0.6780	-16.4230	0.0000	-12.4700	-9.7970
dum_it_AtB_2014	-11.1624	0.6790	-16.4500	0.0000	-12.5000	-9.8250
dum_it_AtB_2015	-11.1472	0.6790	-16.4200	0.0000	-12.4860	-9.8090
dum_it_AtB_2016	-11.0901	0.6790	-16.3360	0.0000	-12.4280	-9.7520
dum_it_C_1991	-7.7818	3.3780	-2.3040	0.0220	-14.4410	-1.1220
dum_it_C_1992	-7.7963	3.2330	-2.4120	0.0170	-14.1700	-1.4230
dum_it_C_1993	-7.8128	3.0910	-2.5280	0.0120	-13.9060	-1.7200
dum_it_C_1994	-7.8309	2.9520	-2.6530	0.0090	-13.6510	-2.0110
dum_it_C_1995	-7.8325	2.9880	-2.6210	0.0090	-13.7230	-1.9420
dum_it_C_1996	-7.8846	2.6410	-2.9850	0.0030	-13.0920	-2.6770
dum_it_C_1997	-7.9308	2.3740	-3.3410	0.0010	-12.6110	-3.2510
dum_it_C_1998	-8.0208	2.0530	-3.9070	0.0000	-12.0680	-3.9730
dum_it_C_1999	-8.0965	1.7680	-4.5790	0.0000	-11.5820	-4.6110
dum_it_C_2000	-8.1098	1.6710	-4.8540	0.0000	-11.4030	-4.8160
dum_it_C_2001	-8.1582	1.5400	-5.2970	0.0000	-11.1940	-5.1220

Table 5: WLS results for capital compensation equation (continued)

	Coefficient	Std. Err.	t	P>|t|	[0.025	0.975]
dum_it_C_2002	-8.2588	1.3230	-6.2440	0.0000	-10.8660	-5.6510
dum_it_C_2003	-8.3454	1.1960	-6.9760	0.0000	-10.7040	-5.9870
dum_it_C_2004	-8.4355	1.1050	-7.6360	0.0000	-10.6130	-6.2570
dum_it_C_2005	-8.4788	1.0420	-8.1330	0.0000	-10.5340	-6.4240
dum_it_C_2006	-8.4293	1.0170	-8.2850	0.0000	-10.4350	-6.4230
dum_it_C_2007	-8.4012	1.0150	-8.2780	0.0000	-10.4020	-6.4000
dum_it_C_2008	-8.3755	1.0370	-8.0800	0.0000	-10.4190	-6.3320
dum_it_C_2009	-8.3649	1.1120	-7.5210	0.0000	-10.5580	-6.1720
dum_it_C_2010	-8.3870	1.1970	-7.0070	0.0000	-10.7470	-6.0270
dum_it_C_2011	-8.3973	1.2630	-6.6480	0.0000	-10.8880	-5.9070
dum_it_C_2012	-8.3853	1.2530	-6.6900	0.0000	-10.8560	-5.9140
dum_it_C_2013	-8.3725	1.2290	-6.8100	0.0000	-10.7960	-5.9490
dum_it_C_2014	-8.3603	1.2020	-6.9530	0.0000	-10.7310	-5.9900
dum_it_C_2015	-8.3441	1.1680	-7.1420	0.0000	-10.6470	-6.0410
dum_it_C_2016	-8.3239	1.1300	-7.3670	0.0000	-10.5510	-6.0960
dum_it_D_1991	-11.5990	0.7070	-16.4090	0.0000	-12.9930	-10.2050
dum_it_D_1992	-11.7055	0.7110	-16.4530	0.0000	-13.1080	-10.3030
dum_it_D_1993	-11.8024	0.7160	-16.4870	0.0000	-13.2140	-10.3910
dum_it_D_1994	-11.8904	0.7200	-16.5120	0.0000	-13.3100	-10.4710
dum_it_D_1995	-11.9645	0.7240	-16.5240	0.0000	-13.3920	-10.5370
dum_it_D_1996	-12.0369	0.7280	-16.5300	0.0000	-13.4730	-10.6010
dum_it_D_1997	-12.1472	0.7330	-16.5820	0.0000	-13.5910	-10.7030
dum_it_D_1998	-12.2243	0.7370	-16.5860	0.0000	-13.6770	-10.7710
dum_it_D_1999	-12.2952	0.7410	-16.5870	0.0000	-13.7570	-10.8340
dum_it_D_2000	-12.3226	0.7450	-16.5410	0.0000	-13.7910	-10.8540
dum_it_D_2001	-12.3386	0.7480	-16.4920	0.0000	-13.8140	-10.8640
dum_it_D_2002	-12.3420	0.7510	-16.4300	0.0000	-13.8230	-10.8610
dum_it_D_2003	-12.3477	0.7540	-16.3740	0.0000	-13.8340	-10.8610
dum_it_D_2004	-12.3318	0.7570	-16.2840	0.0000	-13.8250	-10.8390
dum_it_D_2005	-12.3480	0.7610	-16.2300	0.0000	-13.8480	-10.8480
dum_it_D_2006	-12.3788	0.7650	-16.1820	0.0000	-13.8870	-10.8710
dum_it_D_2007	-12.4201	0.7690	-16.1490	0.0000	-13.9360	-10.9040
dum_it_D_2008	-12.4751	0.7730	-16.1460	0.0000	-13.9980	-10.9520
dum_it_D_2009	-12.5032	0.7760	-16.1230	0.0000	-14.0320	-10.9740
dum_it_D_2010	-12.5313	0.7780	-16.1120	0.0000	-14.0650	-10.9980
dum_it_D_2011	-12.5740	0.7800	-16.1300	0.0000	-14.1110	-11.0370
dum_it_D_2012	-12.6222	0.7810	-16.1590	0.0000	-14.1620	-11.0820
dum_it_D_2013	-12.6878	0.7830	-16.2110	0.0000	-14.2310	-11.1450
dum_it_D_2014	-12.7359	0.7840	-16.2400	0.0000	-14.2820	-11.1900
dum_it_D_2015	-12.7823	0.7860	-16.2690	0.0000	-14.3310	-11.2330
dum_it_D_2016	-12.8267	0.7870	-16.2950	0.0000	-14.3780	-11.2750
dum_it_E_1991	-10.6882	0.6970	-15.3270	0.0000	-12.0630	-9.3130
dum_it_E_1992	-10.8114	0.6990	-15.4610	0.0000	-12.1900	-9.4330

Table 6: WLS results for capital compensation equation (continued)

	Coefficient	Std. Err.	t	P>|t|	[0.025	0.975]
dum_it_E_1993	-10.9152	0.7020	-15.5510	0.0000	-12.2990	-9.5310
dum_it_E_1994	-11.0022	0.7050	-15.6130	0.0000	-12.3920	-9.6130
dum_it_E_1995	-11.0843	0.7080	-15.6630	0.0000	-12.4800	-9.6890
dum_it_E_1996	-11.1456	0.7100	-15.6880	0.0000	-12.5460	-9.7450
dum_it_E_1997	-11.1811	0.7130	-15.6780	0.0000	-12.5870	-9.7750
dum_it_E_1998	-11.2314	0.7160	-15.6890	0.0000	-12.6430	-9.8200
dum_it_E_1999	-11.2952	0.7190	-15.7140	0.0000	-12.7120	-9.8780
dum_it_E_2000	-11.3569	0.7210	-15.7460	0.0000	-12.7790	-9.9350
dum_it_E_2001	-11.4204	0.7230	-15.7930	0.0000	-12.8460	-9.9950
dum_it_E_2002	-11.4730	0.7250	-15.8210	0.0000	-12.9030	-10.0430
dum_it_E_2003	-11.4984	0.7270	-15.8070	0.0000	-12.9330	-10.0640
dum_it_E_2004	-11.5368	0.7300	-15.8080	0.0000	-12.9760	-10.0980
dum_it_E_2005	-11.6077	0.7320	-15.8600	0.0000	-13.0510	-10.1650
dum_it_E_2006	-11.7534	0.7340	-16.0150	0.0000	-13.2000	-10.3060
dum_it_E_2007	-11.8695	0.7360	-16.1270	0.0000	-13.3210	-10.4190
dum_it_E_2008	-11.9297	0.7390	-16.1480	0.0000	-13.3860	-10.4730
dum_it_E_2009	-11.9576	0.7420	-16.1110	0.0000	-13.4210	-10.4940
dum_it_E_2010	-12.0023	0.7460	-16.0800	0.0000	-13.4740	-10.5310
dum_it_E_2011	-12.0478	0.7510	-16.0470	0.0000	-13.5280	-10.5680
dum_it_E_2012	-12.1152	0.7550	-16.0470	0.0000	-13.6040	-10.6270
dum_it_E_2013	-12.1486	0.7590	-16.0160	0.0000	-13.6440	-10.6530
dum_it_E_2014	-12.1777	0.7610	-15.9940	0.0000	-13.6790	-10.6770
dum_it_E_2015	-12.1989	0.7640	-15.9720	0.0000	-13.7050	-10.6930
dum_it_E_2016	-12.2132	0.7660	-15.9500	0.0000	-13.7230	-10.7040
dum_it_F_1991	-13.3948	0.9010	-14.8640	0.0000	-15.1710	-11.6180
dum_it_F_1992	-13.4646	0.8160	-16.4920	0.0000	-15.0740	-11.8550
dum_it_F_1993	-13.4741	0.7710	-17.4690	0.0000	-14.9950	-11.9530
dum_it_F_1994	-13.4259	0.7450	-18.0200	0.0000	-14.8950	-11.9570
dum_it_F_1995	-13.2907	0.7380	-18.0130	0.0000	-14.7450	-11.8360
dum_it_F_1996	-13.2167	0.7240	-18.2600	0.0000	-14.6440	-11.7900
dum_it_F_1997	-13.1746	0.7100	-18.5660	0.0000	-14.5740	-11.7760
dum_it_F_1998	-13.1225	0.6980	-18.7950	0.0000	-14.4990	-11.7460
dum_it_F_1999	-13.1093	0.6850	-19.1410	0.0000	-14.4600	-11.7590
dum_it_F_2000	-13.0087	0.6790	-19.1450	0.0000	-14.3480	-11.6690
dum_it_F_2001	-12.8419	0.6770	-18.9800	0.0000	-14.1760	-11.5080
dum_it_F_2002	-12.7456	0.6740	-18.9170	0.0000	-14.0740	-11.4170
dum_it_F_2003	-12.5592	0.6730	-18.6620	0.0000	-13.8860	-11.2320
dum_it_F_2004	-12.9088	0.6730	-19.1800	0.0000	-14.2360	-11.5820
dum_it_F_2005	-12.7184	0.6720	-18.9310	0.0000	-14.0430	-11.3940
dum_it_F_2006	-12.3669	0.6710	-18.4330	0.0000	-13.6900	-11.0440
dum_it_F_2007	-12.1918	0.6710	-18.1610	0.0000	-13.5150	-10.8680
dum_it_F_2008	-11.8383	0.6730	-17.5940	0.0000	-13.1650	-10.5120
dum_it_F_2009	-11.4925	0.6740	-17.0390	0.0000	-12.8220	-10.1630

Table 7: WLS results for capital compensation equation (continued)

	Coefficient	Std. Err.	t	P>|t|	[0.025	0.975]
dum_it_F_2010	-11.3756	0.6760	-16.8240	0.0000	-12.7090	-10.0430
dum_it_F_2011	-11.3429	0.6790	-16.6990	0.0000	-12.6820	-10.0040
dum_it_F_2012	-11.4285	0.6830	-16.7290	0.0000	-12.7750	-10.0820
dum_it_F_2013	-11.7114	0.6870	-17.0390	0.0000	-13.0660	-10.3560
dum_it_F_2014	-11.9023	0.6920	-17.2100	0.0000	-13.2660	-10.5390
dum_it_F_2015	-12.0918	0.6960	-17.3740	0.0000	-13.4640	-10.7200
dum_it_F_2016	-12.2763	0.7000	-17.5260	0.0000	-13.6570	-10.8950
dum_it_GtH_1991	-10.6388	0.6960	-15.2780	0.0000	-12.0120	-9.2660
dum_it_GtH_1992	-10.8978	0.6800	-16.0340	0.0000	-12.2380	-9.5580
dum_it_GtH_1993	-11.1254	0.6730	-16.5340	0.0000	-12.4520	-9.7990
dum_it_GtH_1994	-11.3155	0.6710	-16.8720	0.0000	-12.6380	-9.9930
dum_it_GtH_1995	-11.4781	0.6710	-17.0970	0.0000	-12.8020	-10.1550
dum_it_GtH_1996	-11.5181	0.6720	-17.1340	0.0000	-12.8430	-10.1930
dum_it_GtH_1997	-11.5613	0.6730	-17.1690	0.0000	-12.8890	-10.2340
dum_it_GtH_1998	-11.5849	0.6750	-17.1610	0.0000	-12.9160	-10.2540
dum_it_GtH_1999	-11.6778	0.6770	-17.2390	0.0000	-13.0130	-10.3420
dum_it_GtH_2000	-11.8593	0.6800	-17.4350	0.0000	-13.2000	-10.5180
dum_it_GtH_2001	-12.0918	0.6830	-17.7010	0.0000	-13.4390	-10.7450
dum_it_GtH_2002	-12.2799	0.6860	-17.8990	0.0000	-13.6330	-10.9270
dum_it_GtH_2003	-12.4529	0.6890	-18.0660	0.0000	-13.8120	-11.0940
dum_it_GtH_2004	-12.3553	0.6930	-17.8360	0.0000	-13.7210	-10.9900
dum_it_GtH_2005	-12.2881	0.6970	-17.6250	0.0000	-13.6630	-10.9140
dum_it_GtH_2006	-12.2366	0.7030	-17.3960	0.0000	-13.6230	-10.8500
dum_it_GtH_2007	-12.2952	0.7100	-17.3240	0.0000	-13.6940	-10.8960
dum_it_GtH_2008	-12.3691	0.7150	-17.3000	0.0000	-13.7790	-10.9600
dum_it_GtH_2009	-12.3759	0.7190	-17.2120	0.0000	-13.7930	-10.9580
dum_it_GtH_2010	-12.3631	0.7220	-17.1160	0.0000	-13.7870	-10.9390
dum_it_GtH_2011	-12.3620	0.7250	-17.0410	0.0000	-13.7920	-10.9320
dum_it_GtH_2012	-12.3810	0.7300	-16.9660	0.0000	-13.8200	-10.9420
dum_it_GtH_2013	-12.4754	0.7340	-17.0000	0.0000	-13.9220	-11.0290
dum_it_GtH_2014	-12.5013	0.7360	-16.9750	0.0000	-13.9530	-11.0490
dum_it_GtH_2015	-12.5078	0.7380	-16.9380	0.0000	-13.9640	-11.0520
dum_it_GtH_2016	-12.4967	0.7400	-16.8920	0.0000	-13.9550	-11.0380
dum_it_I_1991	-10.9807	0.7150	-15.3480	0.0000	-12.3910	-9.5700
dum_it_I_1992	-11.1427	0.7090	-15.7230	0.0000	-12.5400	-9.7460
dum_it_I_1993	-11.2775	0.7060	-15.9730	0.0000	-12.6690	-9.8860
dum_it_I_1994	-11.3858	0.7060	-16.1370	0.0000	-12.7770	-9.9950
dum_it_I_1995	-11.4559	0.7060	-16.2160	0.0000	-12.8490	-10.0630
dum_it_I_1996	-11.4999	0.7080	-16.2460	0.0000	-12.8960	-10.1040
dum_it_I_1997	-11.6386	0.7100	-16.3970	0.0000	-13.0380	-10.2390
dum_it_I_1998	-11.8142	0.7120	-16.5950	0.0000	-13.2180	-10.4110
dum_it_I_1999	-12.0039	0.7140	-16.8100	0.0000	-13.4120	-10.5960
dum_it_I_2000	-12.1607	0.7170	-16.9710	0.0000	-13.5730	-10.7480

Table 8: WLS results for capital compensation equation (continued)

	Coefficient	Std. Err.	t	P>|t|	[0.025	0.975]
dum_it_l_2001	-12.2121	0.7190	-16.9880	0.0000	-13.6290	-10.7950
dum_it_l_2002	-12.1490	0.7210	-16.8490	0.0000	-13.5710	-10.7270
dum_it_l_2003	-12.1176	0.7240	-16.7480	0.0000	-13.5440	-10.6910
dum_it_l_2004	-12.0415	0.7250	-16.6030	0.0000	-13.4710	-10.6120
dum_it_l_2005	-11.9941	0.7260	-16.5140	0.0000	-13.4260	-10.5620
dum_it_l_2006	-12.0045	0.7270	-16.5020	0.0000	-13.4390	-10.5700
dum_it_l_2007	-12.0363	0.7290	-16.5140	0.0000	-13.4730	-10.5990
dum_it_l_2008	-12.1481	0.7310	-16.6290	0.0000	-13.5880	-10.7080
dum_it_l_2009	-12.2460	0.7330	-16.7150	0.0000	-13.6900	-10.8020
dum_it_l_2010	-12.3068	0.7340	-16.7560	0.0000	-13.7550	-10.8590
dum_it_l_2011	-12.3799	0.7360	-16.8290	0.0000	-13.8300	-10.9300
dum_it_l_2012	-12.4040	0.7360	-16.8610	0.0000	-13.8540	-10.9540
dum_it_l_2013	-12.3709	0.7350	-16.8230	0.0000	-13.8210	-10.9210
dum_it_l_2014	-12.3418	0.7360	-16.7630	0.0000	-13.7930	-10.8900
dum_it_l_2015	-12.3039	0.7380	-16.6820	0.0000	-13.7580	-10.8500
dum_it_l_2016	-12.2596	0.7390	-16.5840	0.0000	-13.7170	-10.8020
dum_it_JtK_1991	-11.3282	0.7280	-15.5650	0.0000	-12.7630	-9.8930
dum_it_JtK_1992	-11.4449	0.7270	-15.7400	0.0000	-12.8780	-10.0110
dum_it_JtK_1993	-11.5435	0.7290	-15.8440	0.0000	-12.9800	-10.1070
dum_it_JtK_1994	-11.6240	0.7310	-15.8970	0.0000	-13.0660	-10.1820
dum_it_JtK_1995	-11.6778	0.7350	-15.8980	0.0000	-13.1260	-10.2300
dum_it_JtK_1996	-11.7182	0.7380	-15.8710	0.0000	-13.1740	-10.2630
dum_it_JtK_1997	-11.7840	0.7430	-15.8690	0.0000	-13.2480	-10.3200
dum_it_JtK_1998	-11.8370	0.7470	-15.8510	0.0000	-13.3090	-10.3650
dum_it_JtK_1999	-11.9423	0.7510	-15.8970	0.0000	-13.4230	-10.4610
dum_it_JtK_2000	-12.0781	0.7560	-15.9810	0.0000	-13.5680	-10.5880
dum_it_JtK_2001	-12.2170	0.7600	-16.0760	0.0000	-13.7150	-10.7190
dum_it_JtK_2002	-12.3182	0.7640	-16.1210	0.0000	-13.8250	-10.8120
dum_it_JtK_2003	-12.3806	0.7680	-16.1160	0.0000	-13.8950	-10.8660
dum_it_JtK_2004	-12.3990	0.7720	-16.0600	0.0000	-13.9210	-10.8770
dum_it_JtK_2005	-12.4522	0.7760	-16.0390	0.0000	-13.9830	-10.9220
dum_it_JtK_2006	-12.5386	0.7810	-16.0490	0.0000	-14.0790	-10.9980
dum_it_JtK_2007	-12.6354	0.7860	-16.0730	0.0000	-14.1850	-11.0850
dum_it_JtK_2008	-12.7231	0.7910	-16.0900	0.0000	-14.2820	-11.1640
dum_it_JtK_2009	-12.7795	0.7950	-16.0830	0.0000	-14.3460	-11.2130
dum_it_JtK_2010	-12.8236	0.7980	-16.0730	0.0000	-14.3970	-11.2510
dum_it_JtK_2011	-12.8946	0.8010	-16.0970	0.0000	-14.4740	-11.3150
dum_it_JtK_2012	-12.9803	0.8050	-16.1310	0.0000	-14.5670	-11.3940
dum_it_JtK_2013	-13.0691	0.8080	-16.1670	0.0000	-14.6630	-11.4750
dum_it_JtK_2014	-13.1293	0.8120	-16.1700	0.0000	-14.7300	-11.5280
dum_it_JtK_2015	-13.1746	0.8160	-16.1550	0.0000	-14.7820	-11.5670
dum_it_JtK_2016	-13.2055	0.8190	-16.1240	0.0000	-14.8200	-11.5910
dum_it_LtQ_1991	-15.7474	0.7070	-22.2580	0.0000	-17.1420	-14.3530

Table 9: WLS results for capital compensation equation (continued)

	Coefficient	Std. Err.	t	P>|t|	[0.025	0.975]
dum_it_LtQ_1992	-15.8032	0.7100	-22.2450	0.0000	-17.2040	-14.4030
dum_it_LtQ_1993	-15.8649	0.7130	-22.2420	0.0000	-17.2710	-14.4590
dum_it_LtQ_1994	-15.9330	0.7160	-22.2480	0.0000	-17.3450	-14.5210
dum_it_LtQ_1995	-15.9811	0.7190	-22.2320	0.0000	-17.3980	-14.5640
dum_it_LtQ_1996	-16.0750	0.7220	-22.2760	0.0000	-17.4980	-14.6520
dum_it_LtQ_1997	-16.2821	0.7250	-22.4650	0.0000	-17.7110	-14.8530
dum_it_LtQ_1998	-16.6118	0.7280	-22.8180	0.0000	-18.0470	-15.1770
dum_it_LtQ_1999	-16.8745	0.7310	-23.0730	0.0000	-18.3160	-15.4330
dum_it_LtQ_2000	-16.8727	0.7350	-22.9710	0.0000	-18.3210	-15.4250
dum_it_LtQ_2001	-16.7031	0.7380	-22.6440	0.0000	-18.1570	-15.2490
dum_it_LtQ_2002	-16.4498	0.7410	-22.2090	0.0000	-17.9100	-14.9900
dum_it_LtQ_2003	-16.2252	0.7430	-21.8300	0.0000	-17.6900	-14.7600
dum_it_LtQ_2004	-16.1047	0.7450	-21.6110	0.0000	-17.5740	-14.6360
dum_it_LtQ_2005	-15.8710	0.7470	-21.2570	0.0000	-17.3430	-14.3990
dum_it_LtQ_2006	-15.8713	0.7480	-21.2200	0.0000	-17.3460	-14.3970
dum_it_LtQ_2007	-16.0031	0.7500	-21.3340	0.0000	-17.4820	-14.5240
dum_it_LtQ_2008	-16.0266	0.7530	-21.2850	0.0000	-17.5110	-14.5420
dum_it_LtQ_2009	-16.2616	0.7560	-21.5130	0.0000	-17.7520	-14.7710
dum_it_LtQ_2010	-16.2652	0.7590	-21.4420	0.0000	-17.7610	-14.7700
dum_it_LtQ_2011	-16.3013	0.7610	-21.4220	0.0000	-17.8020	-14.8010
dum_it_LtQ_2012	-16.1628	0.7630	-21.1850	0.0000	-17.6670	-14.6590
dum_it_LtQ_2013	-15.8640	0.7650	-20.7470	0.0000	-17.3710	-14.3560
dum_it_LtQ_2014	-15.4225	0.7660	-20.1250	0.0000	-16.9330	-13.9120
dum_it_LtQ_2015	-14.9786	0.7680	-19.5070	0.0000	-16.4920	-13.4650
dum_it_LtQ_2016	-14.5588	0.7690	-18.9250	0.0000	-16.0750	-13.0420
dum_mt_ICT_1991	-0.0394	0.9530	-0.0410	0.9670	-1.9170	1.8390
dum_mt_ICT_1992	-0.0231	0.7710	-0.0300	0.9760	-1.5430	1.4970
dum_mt_ICT_1993	-0.0186	0.6520	-0.0290	0.9770	-1.3050	1.2670
dum_mt_ICT_1994	-0.0245	0.5740	-0.0430	0.9660	-1.1560	1.1070
dum_mt_ICT_1995	-0.0506	0.5390	-0.0940	0.9250	-1.1140	1.0130
dum_mt_ICT_1996	-0.0948	0.5030	-0.1880	0.8510	-1.0860	0.8970
dum_mt_ICT_1997	-0.0829	0.4530	-0.1830	0.8550	-0.9770	0.8110
dum_mt_ICT_1998	0.0299	0.4040	0.0740	0.9410	-0.7660	0.8260
dum_mt_ICT_1999	0.1633	0.3660	0.4460	0.6560	-0.5580	0.8850
dum_mt_ICT_2000	0.2618	0.3450	0.7590	0.4490	-0.4180	0.9420
dum_mt_ICT_2001	0.3232	0.3370	0.9600	0.3380	-0.3410	0.9870
dum_mt_ICT_2002	0.3201	0.3300	0.9710	0.3330	-0.3300	0.9700
dum_mt_ICT_2003	0.3041	0.3160	0.9630	0.3360	-0.3180	0.9260
dum_mt_ICT_2004	0.3202	0.2940	1.0900	0.2770	-0.2590	0.8990
dum_mt_ICT_2005	0.3921	0.2710	1.4460	0.1500	-0.1430	0.9270
dum_mt_ICT_2006	0.4712	0.2500	1.8880	0.0600	-0.0210	0.9630
dum_mt_ICT_2007	0.4795	0.2350	2.0400	0.0430	0.0160	0.9430
dum_mt_ICT_2008	0.4817	0.2250	2.1430	0.0330	0.0390	0.9250

Table 10: WLS results for capital compensation equation (continued)

	Coefficient	Std. Err.	t	P>|t|	[0.025	0.975]
dum_mt_ICT_2009	0.4125	0.2140	1.9260	0.0550	-0.0100	0.8350
dum_mt_ICT_2010	0.3020	0.2040	1.4810	0.1400	-0.1000	0.7040
dum_mt_ICT_2011	0.2600	0.1960	1.3270	0.1860	-0.1260	0.6460
dum_mt_ICT_2012	0.2212	0.1910	1.1560	0.2490	-0.1560	0.5980
dum_mt_ICT_2013	0.1633	0.1900	0.8610	0.3900	-0.2100	0.5370
dum_mt_ICT_2014	0.1067	0.1840	0.5810	0.5620	-0.2550	0.4690
dum_mt_ICT_2015	0.0629	0.1770	0.3550	0.7230	-0.2860	0.4120
dum_mt_ICT_2016	0.0260	0.1700	0.1530	0.8780	-0.3080	0.3600
lnK	0.7480	0.0490	15.2370	0.0000	0.6510	0.8450

Table 11: WLS results for labor compensation equation

Dep. Variable:		lnWLshare		R-squared:		0.987
No. Observations:		468		Adj. R-squared:		0.979
Df Residuals:		702		F-statistic:		112.9
Df Model:		286		Prob. F-statistic:		7.67E-294
Log-Likelihood:		46.400		AIC:		481.200
Covariance Type:		nonrobust		BIC:		1788
	Coefficient	Std. Err.	t	P>|t|	[0.025	0.975]
dum_it_AtB_1991	-22.8524	0.2290	-99.9980	0.0000	-23.3020	-22.4030
dum_it_AtB_1992	-22.9560	0.2280	-100.7500	0.0000	-23.4040	-22.5080
dum_it_AtB_1993	-23.0384	0.2270	-101.3950	0.0000	-23.4850	-22.5920
dum_it_AtB_1994	-23.0951	0.2270	-101.9140	0.0000	-23.5410	-22.6500
dum_it_AtB_1995	-23.1045	0.2260	-102.2090	0.0000	-23.5490	-22.6600
dum_it_AtB_1996	-23.1298	0.2250	-102.5820	0.0000	-23.5730	-22.6870
dum_it_AtB_1997	-23.1062	0.2250	-102.7900	0.0000	-23.5480	-22.6640
dum_it_AtB_1998	-23.0957	0.2240	-102.9170	0.0000	-23.5370	-22.6550
dum_it_AtB_1999	-23.0473	0.2240	-102.8480	0.0000	-23.4880	-22.6070
dum_it_AtB_2000	-22.9378	0.2240	-102.3760	0.0000	-23.3780	-22.4970
dum_it_AtB_2001	-22.8844	0.2240	-102.1490	0.0000	-23.3250	-22.4440
dum_it_AtB_2002	-22.9001	0.2240	-102.2990	0.0000	-23.3400	-22.4600
dum_it_AtB_2003	-22.9932	0.2240	-102.8600	0.0000	-23.4330	-22.5540
dum_it_AtB_2004	-23.1361	0.2230	-103.6800	0.0000	-23.5750	-22.6970
dum_it_AtB_2005	-23.2090	0.2230	-104.2570	0.0000	-23.6470	-22.7710
dum_it_AtB_2006	-23.2406	0.2220	-104.5510	0.0000	-23.6780	-22.8040
dum_it_AtB_2007	-23.2359	0.2220	-104.6770	0.0000	-23.6720	-22.8000
dum_it_AtB_2008	-23.2486	0.2220	-104.8990	0.0000	-23.6840	-22.8130
dum_it_AtB_2009	-23.2543	0.2210	-105.0430	0.0000	-23.6890	-22.8190
dum_it_AtB_2010	-23.2430	0.2210	-105.1840	0.0000	-23.6770	-22.8090
dum_it_AtB_2011	-23.1665	0.2200	-105.1030	0.0000	-23.6000	-22.7330
dum_it_AtB_2012	-23.0979	0.2200	-105.0220	0.0000	-23.5300	-22.6660
dum_it_AtB_2013	-23.0567	0.2200	-104.8240	0.0000	-23.4890	-22.6240
dum_it_AtB_2014	-23.0838	0.2200	-104.9350	0.0000	-23.5160	-22.6510
dum_it_AtB_2015	-23.1589	0.2200	-105.1800	0.0000	-23.5920	-22.7260
dum_it_AtB_2016	-23.2806	0.2210	-105.5510	0.0000	-23.7140	-22.8470
dum_it_C_1991	-18.5747	7.2270	-2.5700	0.0110	-32.7810	-4.3680
dum_it_C_1992	-18.9750	5.0190	-3.7810	0.0000	-28.8410	-9.1090
dum_it_C_1993	-19.2236	4.1480	-4.6340	0.0000	-27.3780	-11.0690
dum_it_C_1994	-19.3647	3.7700	-5.1370	0.0000	-26.7750	-11.9540
dum_it_C_1995	-19.5168	3.7240	-5.2400	0.0000	-26.8380	-12.1960
dum_it_C_1996	-19.4429	3.7490	-5.1860	0.0000	-26.8120	-12.0740
dum_it_C_1997	-19.3300	4.4860	-4.3090	0.0000	-28.1490	-10.5110
dum_it_C_1998	-19.3581	3.9190	-4.9390	0.0000	-27.0620	-11.6540
dum_it_C_1999	-19.3284	3.8320	-5.0440	0.0000	-26.8610	-11.7950
dum_it_C_2000	-19.5447	3.4070	-5.7370	0.0000	-26.2410	-12.8480
dum_it_C_2001	-19.4281	3.3840	-5.7410	0.0000	-26.0800	-12.7760

Table 12: WLS results for labor compensation equation (continued)

	Coefficient	Std. Err.	t	P>|t|	[0.025	0.975]
dum_it_C_2002	-19.4369	3.0490	-6.3740	0.0000	-25.4310	-13.4430
dum_it_C_2003	-19.5461	2.9110	-6.7140	0.0000	-25.2690	-13.8240
dum_it_C_2004	-19.9497	1.8760	-10.6330	0.0000	-23.6380	-16.2620
dum_it_C_2005	-20.0304	1.5640	-12.8080	0.0000	-23.1040	-16.9560
dum_it_C_2006	-20.1028	1.4410	-13.9550	0.0000	-22.9350	-17.2710
dum_it_C_2007	-19.7973	1.6870	-11.7370	0.0000	-23.1130	-16.4820
dum_it_C_2008	-19.3196	2.5270	-7.6460	0.0000	-24.2860	-14.3530
dum_it_C_2009	-19.0376	3.9100	-4.8690	0.0000	-26.7230	-11.3520
dum_it_C_2010	-19.1740	4.1490	-4.6220	0.0000	-27.3290	-11.0190
dum_it_C_2011	-19.5231	3.5100	-5.5620	0.0000	-26.4230	-12.6230
dum_it_C_2012	-19.7696	2.7640	-7.1530	0.0000	-25.2030	-14.3370
dum_it_C_2013	-19.6567	2.6060	-7.5430	0.0000	-24.7790	-14.5340
dum_it_C_2014	-19.5431	2.7180	-7.1900	0.0000	-24.8860	-14.2000
dum_it_C_2015	-19.2739	3.2700	-5.8940	0.0000	-25.7020	-12.8460
dum_it_C_2016	-18.6854	5.1990	-3.5940	0.0000	-28.9050	-8.4660
dum_it_D_1991	-23.1247	0.2290	-100.8710	0.0000	-23.5750	-22.6740
dum_it_D_1992	-23.1476	0.2270	-102.0100	0.0000	-23.5940	-22.7020
dum_it_D_1993	-23.1587	0.2250	-102.7470	0.0000	-23.6020	-22.7160
dum_it_D_1994	-23.1582	0.2240	-103.2130	0.0000	-23.5990	-22.7170
dum_it_D_1995	-23.1241	0.2240	-103.2440	0.0000	-23.5640	-22.6840
dum_it_D_1996	-23.1222	0.2230	-103.5750	0.0000	-23.5610	-22.6830
dum_it_D_1997	-23.1111	0.2220	-103.8990	0.0000	-23.5480	-22.6740
dum_it_D_1998	-23.1458	0.2220	-104.3770	0.0000	-23.5820	-22.7100
dum_it_D_1999	-23.1838	0.2210	-104.7690	0.0000	-23.6190	-22.7490
dum_it_D_2000	-23.2565	0.2210	-105.2430	0.0000	-23.6910	-22.8220
dum_it_D_2001	-23.3054	0.2210	-105.6210	0.0000	-23.7390	-22.8720
dum_it_D_2002	-23.3746	0.2200	-106.1860	0.0000	-23.8070	-22.9420
dum_it_D_2003	-23.4283	0.2190	-106.7410	0.0000	-23.8600	-22.9970
dum_it_D_2004	-23.4872	0.2190	-107.2900	0.0000	-23.9180	-23.0570
dum_it_D_2005	-23.5463	0.2180	-107.7840	0.0000	-23.9760	-23.1170
dum_it_D_2006	-23.5892	0.2180	-108.1870	0.0000	-24.0180	-23.1610
dum_it_D_2007	-23.6077	0.2180	-108.4310	0.0000	-24.0360	-23.1800
dum_it_D_2008	-23.5529	0.2170	-108.3120	0.0000	-23.9800	-23.1250
dum_it_D_2009	-23.4843	0.2170	-108.1370	0.0000	-23.9110	-23.0570
dum_it_D_2010	-23.4202	0.2170	-107.9810	0.0000	-23.8470	-22.9940
dum_it_D_2011	-23.3392	0.2160	-107.8910	0.0000	-23.7640	-22.9140
dum_it_D_2012	-23.2548	0.2160	-107.8750	0.0000	-23.6790	-22.8310
dum_it_D_2013	-23.2722	0.2150	-108.0840	0.0000	-23.6950	-22.8490
dum_it_D_2014	-23.2812	0.2150	-108.2080	0.0000	-23.7040	-22.8580
dum_it_D_2015	-23.3078	0.2150	-108.3160	0.0000	-23.7310	-22.8850
dum_it_D_2016	-23.3497	0.2150	-108.3870	0.0000	-23.7730	-22.9260
dum_it_E_1991	-21.2448	1.5270	-13.9140	0.0000	-24.2460	-18.2440
dum_it_E_1992	-21.3792	1.2380	-17.2690	0.0000	-23.8130	-18.9460

Table 13: WLS results for labor compensation equation (continued)

	Coefficient	Std. Err.	t	P>|t|	[0.025	0.975]
dum_it_E_1993	-21.4472	1.0790	-19.8710	0.0000	-23.5690	-19.3260
dum_it_E_1994	-21.4609	0.9950	-21.5760	0.0000	-23.4160	-19.5060
dum_it_E_1995	-21.3651	1.0090	-21.1710	0.0000	-23.3490	-19.3810
dum_it_E_1996	-21.2324	1.0220	-20.7780	0.0000	-23.2410	-19.2240
dum_it_E_1997	-21.2290	1.0060	-21.1030	0.0000	-23.2060	-19.2520
dum_it_E_1998	-21.2292	0.9040	-23.4880	0.0000	-23.0060	-19.4530
dum_it_E_1999	-21.2113	0.8200	-25.8530	0.0000	-22.8240	-19.5990
dum_it_E_2000	-21.2586	0.7100	-29.9340	0.0000	-22.6550	-19.8630
dum_it_E_2001	-21.3639	0.6130	-34.8450	0.0000	-22.5690	-20.1590
dum_it_E_2002	-21.5405	0.5280	-40.8140	0.0000	-22.5780	-20.5030
dum_it_E_2003	-21.6686	0.4910	-44.1070	0.0000	-22.6340	-20.7030
dum_it_E_2004	-21.6550	0.4740	-45.7140	0.0000	-22.5860	-20.7240
dum_it_E_2005	-21.5188	0.4670	-46.0520	0.0000	-22.4370	-20.6000
dum_it_E_2006	-21.4027	0.4310	-49.6620	0.0000	-22.2500	-20.5560
dum_it_E_2007	-21.3183	0.4140	-51.5140	0.0000	-22.1320	-20.5050
dum_it_E_2008	-21.5245	0.3550	-60.6180	0.0000	-22.2230	-20.8270
dum_it_E_2009	-21.6843	0.3260	-66.4960	0.0000	-22.3250	-21.0430
dum_it_E_2010	-21.8078	0.3060	-71.2110	0.0000	-22.4100	-21.2060
dum_it_E_2011	-21.8742	0.3040	-72.0230	0.0000	-22.4710	-21.2770
dum_it_E_2012	-21.8976	0.3090	-70.9800	0.0000	-22.5040	-21.2910
dum_it_E_2013	-21.7876	0.3360	-64.7600	0.0000	-22.4490	-21.1260
dum_it_E_2014	-21.8153	0.3370	-64.7500	0.0000	-22.4780	-21.1530
dum_it_E_2015	-21.9099	0.3240	-67.6370	0.0000	-22.5470	-21.2730
dum_it_E_2016	-22.0728	0.3010	-73.4310	0.0000	-22.6640	-21.4820
dum_it_F_1991	-21.3213	0.4170	-51.1350	0.0000	-22.1410	-20.5020
dum_it_F_1992	-21.3793	0.3470	-61.5420	0.0000	-22.0620	-20.6960
dum_it_F_1993	-21.4342	0.3130	-68.3840	0.0000	-22.0500	-20.8180
dum_it_F_1994	-21.4853	0.2960	-72.4980	0.0000	-22.0680	-20.9030
dum_it_F_1995	-21.5371	0.2940	-73.2350	0.0000	-22.1150	-20.9590
dum_it_F_1996	-21.5726	0.2900	-74.2800	0.0000	-22.1430	-21.0020
dum_it_F_1997	-21.5900	0.2870	-75.2410	0.0000	-22.1540	-21.0260
dum_it_F_1998	-21.6669	0.2740	-79.0450	0.0000	-22.2060	-21.1280
dum_it_F_1999	-21.7843	0.2540	-85.6350	0.0000	-22.2840	-21.2840
dum_it_F_2000	-21.8464	0.2470	-88.6130	0.0000	-22.3310	-21.3620
dum_it_F_2001	-21.9293	0.2400	-91.2490	0.0000	-22.4020	-21.4570
dum_it_F_2002	-21.9865	0.2350	-93.5210	0.0000	-22.4490	-21.5240
dum_it_F_2003	-22.0100	0.2330	-94.3190	0.0000	-22.4690	-21.5510
dum_it_F_2004	-21.9767	0.2320	-94.5390	0.0000	-22.4340	-21.5200
dum_it_F_2005	-22.1039	0.2270	-97.3070	0.0000	-22.5500	-21.6570
dum_it_F_2006	-22.2816	0.2220	-100.2360	0.0000	-22.7190	-21.8450
dum_it_F_2007	-22.4267	0.2200	-102.0970	0.0000	-22.8580	-21.9950
dum_it_F_2008	-22.4822	0.2190	-102.8480	0.0000	-22.9120	-22.0520
dum_it_F_2009	-22.4685	0.2180	-102.9160	0.0000	-22.8980	-22.0390

Table 14: WLS results for labor compensation equation (continued)

	Coefficient	Std. Err.	t	P>|t|	[0.025	0.975]
dum_it_F_2010	-22.4101	0.2190	-102.4020	0.0000	-22.8400	-21.9800
dum_it_F_2011	-22.3751	0.2200	-101.7260	0.0000	-22.8070	-21.9430
dum_it_F_2012	-22.4236	0.2200	-102.0940	0.0000	-22.8550	-21.9920
dum_it_F_2013	-22.4410	0.2180	-102.7210	0.0000	-22.8700	-22.0120
dum_it_F_2014	-22.4288	0.2180	-102.9000	0.0000	-22.8570	-22.0000
dum_it_F_2015	-22.3944	0.2180	-102.9150	0.0000	-22.8220	-21.9670
dum_it_F_2016	-22.3387	0.2170	-102.7750	0.0000	-22.7660	-21.9110
dum_it_GtH_1991	-22.9571	0.2320	-99.0840	0.0000	-23.4130	-22.5020
dum_it_GtH_1992	-23.0511	0.2280	-100.9730	0.0000	-23.5000	-22.6020
dum_it_GtH_1993	-23.1323	0.2270	-102.0910	0.0000	-23.5780	-22.6870
dum_it_GtH_1994	-23.2022	0.2260	-102.7880	0.0000	-23.6460	-22.7580
dum_it_GtH_1995	-23.2562	0.2260	-103.1010	0.0000	-23.7000	-22.8130
dum_it_GtH_1996	-23.3302	0.2250	-103.5010	0.0000	-23.7730	-22.8870
dum_it_GtH_1997	-23.3890	0.2250	-103.9270	0.0000	-23.8310	-22.9470
dum_it_GtH_1998	-23.4435	0.2250	-104.3300	0.0000	-23.8850	-23.0020
dum_it_GtH_1999	-23.5042	0.2240	-104.7880	0.0000	-23.9450	-23.0630
dum_it_GtH_2000	-23.5190	0.2240	-104.9620	0.0000	-23.9590	-23.0790
dum_it_GtH_2001	-23.5312	0.2240	-105.1090	0.0000	-23.9710	-23.0910
dum_it_GtH_2002	-23.5681	0.2240	-105.3550	0.0000	-24.0080	-23.1280
dum_it_GtH_2003	-23.5878	0.2240	-105.5060	0.0000	-24.0270	-23.1480
dum_it_GtH_2004	-23.6488	0.2240	-105.8020	0.0000	-24.0880	-23.2090
dum_it_GtH_2005	-23.7329	0.2230	-106.2430	0.0000	-24.1720	-23.2940
dum_it_GtH_2006	-23.8233	0.2230	-106.6980	0.0000	-24.2620	-23.3840
dum_it_GtH_2007	-23.8922	0.2230	-107.1040	0.0000	-24.3310	-23.4540
dum_it_GtH_2008	-23.9201	0.2230	-107.2120	0.0000	-24.3590	-23.4820
dum_it_GtH_2009	-23.9206	0.2230	-107.2630	0.0000	-24.3590	-23.4820
dum_it_GtH_2010	-23.9447	0.2230	-107.4030	0.0000	-24.3830	-23.5060
dum_it_GtH_2011	-23.9698	0.2230	-107.5340	0.0000	-24.4080	-23.5320
dum_it_GtH_2012	-24.0262	0.2230	-107.9250	0.0000	-24.4640	-23.5890
dum_it_GtH_2013	-24.0289	0.2220	-108.1920	0.0000	-24.4650	-23.5920
dum_it_GtH_2014	-24.0444	0.2220	-108.4020	0.0000	-24.4800	-23.6080
dum_it_GtH_2015	-24.0553	0.2220	-108.5570	0.0000	-24.4910	-23.6200
dum_it_GtH_2016	-24.0621	0.2210	-108.6630	0.0000	-24.4970	-23.6270
dum_it_I_1991	-21.7785	0.6310	-34.5120	0.0000	-23.0190	-20.5380
dum_it_I_1992	-21.8952	0.5290	-41.3600	0.0000	-22.9360	-20.8550
dum_it_I_1993	-21.9896	0.4680	-47.0040	0.0000	-22.9090	-21.0700
dum_it_I_1994	-22.0672	0.4300	-51.3600	0.0000	-22.9120	-21.2230
dum_it_I_1995	-22.1164	0.4160	-53.1590	0.0000	-22.9340	-21.2990
dum_it_I_1996	-22.2081	0.3960	-56.0730	0.0000	-22.9870	-21.4300
dum_it_I_1997	-22.2291	0.3760	-59.0690	0.0000	-22.9690	-21.4890
dum_it_I_1998	-22.2618	0.3470	-64.1190	0.0000	-22.9440	-21.5790
dum_it_I_1999	-22.2784	0.3230	-69.0620	0.0000	-22.9130	-21.6440
dum_it_I_2000	-22.2796	0.3080	-72.3370	0.0000	-22.8850	-21.6740

Table 15: WLS results for labor compensation equation (continued)

	Coefficient	Std. Err.	t	P>|t|	[0.025	0.975]
dum_it_l_2001	-22.3257	0.2910	-76.7100	0.0000	-22.8980	-21.7540
dum_it_l_2002	-22.4364	0.2740	-81.9550	0.0000	-22.9750	-21.8980
dum_it_l_2003	-22.5082	0.2580	-87.1850	0.0000	-23.0160	-22.0010
dum_it_l_2004	-22.6722	0.2440	-92.7810	0.0000	-23.1530	-22.1920
dum_it_l_2005	-22.8048	0.2350	-97.1670	0.0000	-23.2660	-22.3430
dum_it_l_2006	-22.9321	0.2270	-100.8920	0.0000	-23.3790	-22.4850
dum_it_l_2007	-23.0627	0.2230	-103.6070	0.0000	-23.5000	-22.6250
dum_it_l_2008	-23.0048	0.2200	-104.3610	0.0000	-23.4380	-22.5710
dum_it_l_2009	-22.8213	0.2190	-104.1010	0.0000	-23.2520	-22.3900
dum_it_l_2010	-22.7429	0.2180	-104.3870	0.0000	-23.1710	-22.3150
dum_it_l_2011	-22.6728	0.2160	-104.8040	0.0000	-23.0980	-22.2480
dum_it_l_2012	-22.7056	0.2150	-105.7740	0.0000	-23.1280	-22.2840
dum_it_l_2013	-22.7880	0.2130	-106.8140	0.0000	-23.2070	-22.3690
dum_it_l_2014	-22.8317	0.2120	-107.4880	0.0000	-23.2490	-22.4140
dum_it_l_2015	-22.8532	0.2120	-107.9290	0.0000	-23.2690	-22.4370
dum_it_l_2016	-22.8516	0.2110	-108.1620	0.0000	-23.2670	-22.4360
dum_it_JtK_1991	-22.2505	1.2100	-18.3810	0.0000	-24.6300	-19.8710
dum_it_JtK_1992	-22.3308	0.9670	-23.1000	0.0000	-24.2310	-20.4310
dum_it_JtK_1993	-22.4340	0.7880	-28.4850	0.0000	-23.9820	-20.8860
dum_it_JtK_1994	-22.5555	0.6540	-34.5120	0.0000	-23.8400	-21.2710
dum_it_JtK_1995	-22.6980	0.5560	-40.8060	0.0000	-23.7910	-21.6050
dum_it_JtK_1996	-22.8705	0.4760	-48.0230	0.0000	-23.8070	-21.9340
dum_it_JtK_1997	-22.9808	0.4110	-55.9430	0.0000	-23.7880	-22.1730
dum_it_JtK_1998	-23.0521	0.3720	-61.9260	0.0000	-23.7840	-22.3200
dum_it_JtK_1999	-23.0887	0.3310	-69.8260	0.0000	-23.7390	-22.4390
dum_it_JtK_2000	-23.1149	0.2940	-78.7060	0.0000	-23.6920	-22.5380
dum_it_JtK_2001	-23.1863	0.2680	-86.5400	0.0000	-23.7130	-22.6600
dum_it_JtK_2002	-23.3103	0.2520	-92.3850	0.0000	-23.8060	-22.8140
dum_it_JtK_2003	-23.4052	0.2430	-96.2750	0.0000	-23.8830	-22.9270
dum_it_JtK_2004	-23.4605	0.2390	-98.1280	0.0000	-23.9300	-22.9910
dum_it_JtK_2005	-23.5033	0.2340	-100.5990	0.0000	-23.9630	-23.0440
dum_it_JtK_2006	-23.6017	0.2270	-103.8190	0.0000	-24.0490	-23.1550
dum_it_JtK_2007	-23.6599	0.2230	-106.0400	0.0000	-24.0980	-23.2210
dum_it_JtK_2008	-23.7146	0.2210	-107.4840	0.0000	-24.1480	-23.2810
dum_it_JtK_2009	-23.7187	0.2190	-108.3580	0.0000	-24.1490	-23.2880
dum_it_JtK_2010	-23.7447	0.2170	-109.2230	0.0000	-24.1720	-23.3170
dum_it_JtK_2011	-23.7083	0.2160	-109.6180	0.0000	-24.1330	-23.2830
dum_it_JtK_2012	-23.7570	0.2160	-110.1270	0.0000	-24.1810	-23.3330
dum_it_JtK_2013	-23.7958	0.2150	-110.5870	0.0000	-24.2190	-23.3730
dum_it_JtK_2014	-23.8025	0.2150	-110.9380	0.0000	-24.2240	-23.3810
dum_it_JtK_2015	-23.7917	0.2140	-111.1860	0.0000	-24.2120	-23.3710
dum_it_JtK_2016	-23.7601	0.2140	-111.2720	0.0000	-24.1800	-23.3400
dum_it_LtQ_1991	-22.8775	0.2370	-96.5020	0.0000	-23.3440	-22.4120

Table 16: WLS results for labor compensation equation (continued)

	Coefficient	Std. Err.	t	P>|t|	[0.025	0.975]
dum_it_LtQ_1992	-22.9378	0.2340	-97.9340	0.0000	-23.3980	-22.4770
dum_it_LtQ_1993	-23.0040	0.2320	-99.1840	0.0000	-23.4600	-22.5480
dum_it_LtQ_1994	-23.0742	0.2300	-100.2740	0.0000	-23.5270	-22.6220
dum_it_LtQ_1995	-23.1394	0.2290	-101.1330	0.0000	-23.5890	-22.6900
dum_it_LtQ_1996	-23.2231	0.2280	-101.9940	0.0000	-23.6710	-22.7760
dum_it_LtQ_1997	-23.2852	0.2270	-102.7200	0.0000	-23.7310	-22.8400
dum_it_LtQ_1998	-23.3216	0.2260	-103.3140	0.0000	-23.7650	-22.8780
dum_it_LtQ_1999	-23.3787	0.2250	-103.9110	0.0000	-23.8210	-22.9360
dum_it_LtQ_2000	-23.3965	0.2240	-104.2500	0.0000	-23.8380	-22.9550
dum_it_LtQ_2001	-23.4368	0.2240	-104.6740	0.0000	-23.8770	-22.9970
dum_it_LtQ_2002	-23.4821	0.2230	-105.0730	0.0000	-23.9210	-23.0430
dum_it_LtQ_2003	-23.5369	0.2230	-105.5310	0.0000	-23.9750	-23.0980
dum_it_LtQ_2004	-23.6055	0.2230	-105.9560	0.0000	-24.0430	-23.1680
dum_it_LtQ_2005	-23.6822	0.2230	-106.3790	0.0000	-24.1200	-23.2450
dum_it_LtQ_2006	-23.7249	0.2220	-106.6400	0.0000	-24.1620	-23.2880
dum_it_LtQ_2007	-23.7675	0.2220	-106.9380	0.0000	-24.2040	-23.3310
dum_it_LtQ_2008	-23.7848	0.2220	-107.2050	0.0000	-24.2210	-23.3490
dum_it_LtQ_2009	-23.7744	0.2210	-107.4700	0.0000	-24.2090	-23.3400
dum_it_LtQ_2010	-23.8344	0.2210	-107.9040	0.0000	-24.2690	-23.4000
dum_it_LtQ_2011	-23.8955	0.2210	-108.2280	0.0000	-24.3290	-23.4610
dum_it_LtQ_2012	-23.9310	0.2210	-108.5240	0.0000	-24.3640	-23.4980
dum_it_LtQ_2013	-23.9802	0.2200	-108.8130	0.0000	-24.4130	-23.5470
dum_it_LtQ_2014	-23.9978	0.2200	-109.0060	0.0000	-24.4310	-23.5650
dum_it_LtQ_2015	-23.9963	0.2200	-109.1190	0.0000	-24.4290	-23.5640
dum_it_LtQ_2016	-23.9747	0.2200	-109.1410	0.0000	-24.4060	-23.5430
dum_nt_1_1991	1.2018	0.1840	6.5270	0.0000	0.8400	1.5640
dum_nt_1_1992	1.1574	0.1580	7.3270	0.0000	0.8470	1.4680
dum_nt_1_1993	1.1309	0.1380	8.1800	0.0000	0.8590	1.4030
dum_nt_1_1994	1.1190	0.1240	9.0530	0.0000	0.8760	1.3620
dum_nt_1_1995	1.1257	0.1150	9.7550	0.0000	0.8990	1.3520
dum_nt_1_1996	1.1281	0.1050	10.6990	0.0000	0.9210	1.3350
dum_nt_1_1997	1.0904	0.0950	11.5240	0.0000	0.9040	1.2760
dum_nt_1_1998	1.0690	0.0870	12.3260	0.0000	0.8980	1.2390
dum_nt_1_1999	1.0829	0.0790	13.7740	0.0000	0.9280	1.2370
dum_nt_1_2000	1.0808	0.0740	14.6800	0.0000	0.9360	1.2260
dum_nt_1_2001	1.1189	0.0700	16.0040	0.0000	0.9810	1.2560
dum_nt_1_2002	1.1410	0.0660	17.2330	0.0000	1.0110	1.2710
dum_nt_1_2003	1.1273	0.0620	18.2540	0.0000	1.0060	1.2490
dum_nt_1_2004	1.1155	0.0580	19.3720	0.0000	1.0020	1.2290
dum_nt_1_2005	1.1211	0.0530	21.2550	0.0000	1.0170	1.2250
dum_nt_1_2006	1.1194	0.0480	23.3240	0.0000	1.0250	1.2140
dum_nt_1_2007	1.1127	0.0440	25.1680	0.0000	1.0260	1.2000
dum_nt_1_2008	1.1080	0.0420	26.3630	0.0000	1.0250	1.1910

Table 17: WLS results for labor compensation equation (continued)

	Coefficient	Std. Err.	t	P>|t|	[0.025	0.975]
dum_nt_1_2009	1.0941	0.0410	26.5760	0.0000	1.0130	1.1750
dum_nt_1_2010	1.1173	0.0400	28.2030	0.0000	1.0390	1.1950
dum_nt_1_2011	1.1398	0.0380	30.3090	0.0000	1.0660	1.2140
dum_nt_1_2012	1.1592	0.0360	32.6380	0.0000	1.0890	1.2290
dum_nt_1_2013	1.1804	0.0340	34.9990	0.0000	1.1140	1.2470
dum_nt_1_2014	1.1988	0.0330	36.8500	0.0000	1.1350	1.2630
dum_nt_1_2015	1.2192	0.0320	38.4050	0.0000	1.1570	1.2820
dum_nt_1_2016	1.2432	0.0310	39.5450	0.0000	1.1810	1.3050
dum_nt_2_1991	0.2674	0.0900	2.9590	0.0030	0.0900	0.4450
dum_nt_2_1992	0.2902	0.0800	3.6080	0.0000	0.1320	0.4480
dum_nt_2_1993	0.3073	0.0730	4.2060	0.0000	0.1640	0.4510
dum_nt_2_1994	0.3156	0.0680	4.6670	0.0000	0.1830	0.4490
dum_nt_2_1995	0.3142	0.0650	4.8440	0.0000	0.1870	0.4420
dum_nt_2_1996	0.3001	0.0610	4.8940	0.0000	0.1800	0.4210
dum_nt_2_1997	0.2705	0.0570	4.7370	0.0000	0.1580	0.3830
dum_nt_2_1998	0.2653	0.0530	4.9710	0.0000	0.1600	0.3700
dum_nt_2_1999	0.2565	0.0500	5.0950	0.0000	0.1580	0.3560
dum_nt_2_2000	0.2569	0.0490	5.2900	0.0000	0.1610	0.3520
dum_nt_2_2001	0.2428	0.0470	5.1620	0.0000	0.1500	0.3350
dum_nt_2_2002	0.2573	0.0450	5.7150	0.0000	0.1690	0.3460
dum_nt_2_2003	0.2551	0.0430	5.9600	0.0000	0.1710	0.3390
dum_nt_2_2004	0.2789	0.0410	6.8850	0.0000	0.1990	0.3580
dum_nt_2_2005	0.2736	0.0370	7.3170	0.0000	0.2000	0.3470
dum_nt_2_2006	0.2481	0.0340	7.2900	0.0000	0.1810	0.3150
dum_nt_2_2007	0.2285	0.0320	7.0760	0.0000	0.1650	0.2920
dum_nt_2_2008	0.2122	0.0310	6.8440	0.0000	0.1510	0.2730
dum_nt_2_2009	0.1835	0.0300	6.0220	0.0000	0.1240	0.2430
dum_nt_2_2010	0.2063	0.0300	6.8940	0.0000	0.1470	0.2650
dum_nt_2_2011	0.2068	0.0290	7.2090	0.0000	0.1500	0.2630
dum_nt_2_2012	0.2282	0.0270	8.3490	0.0000	0.1740	0.2820
dum_nt_2_2013	0.2556	0.0270	9.5660	0.0000	0.2030	0.3080
dum_nt_2_2014	0.2564	0.0260	9.8920	0.0000	0.2050	0.3070
dum_nt_2_2015	0.2419	0.0250	9.6260	0.0000	0.1930	0.2910
dum_nt_2_2016	0.2103	0.0240	8.6330	0.0000	0.1620	0.2580
lnL	1.1231	0.0110	100.7410	0.0000	1.1010	1.1450

Figure 8: Capital elasticity of substitution estimates with different estimation windows

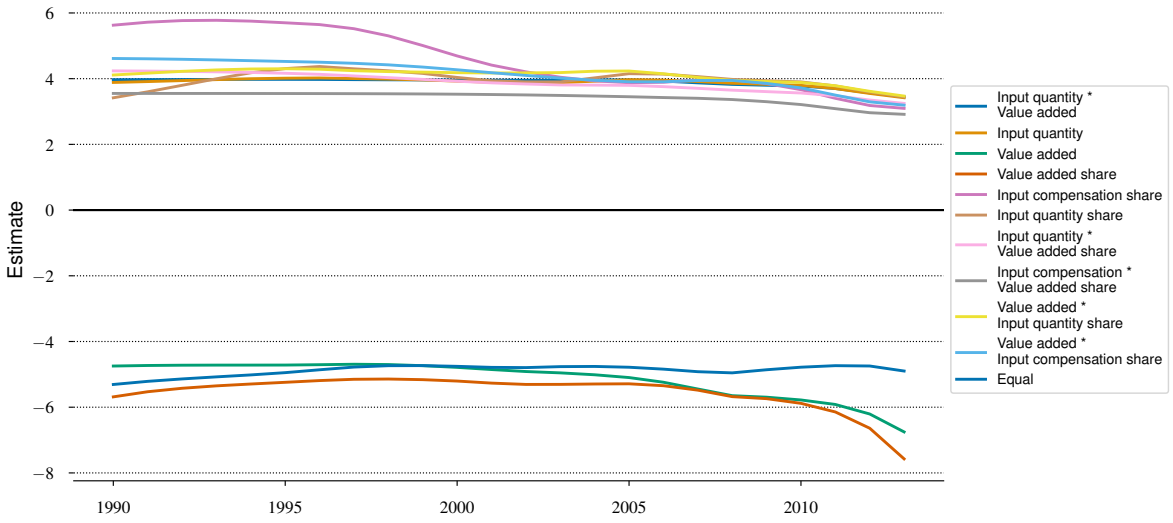

Figure 9: Labor elasticity of substitution estimates with different estimation windows

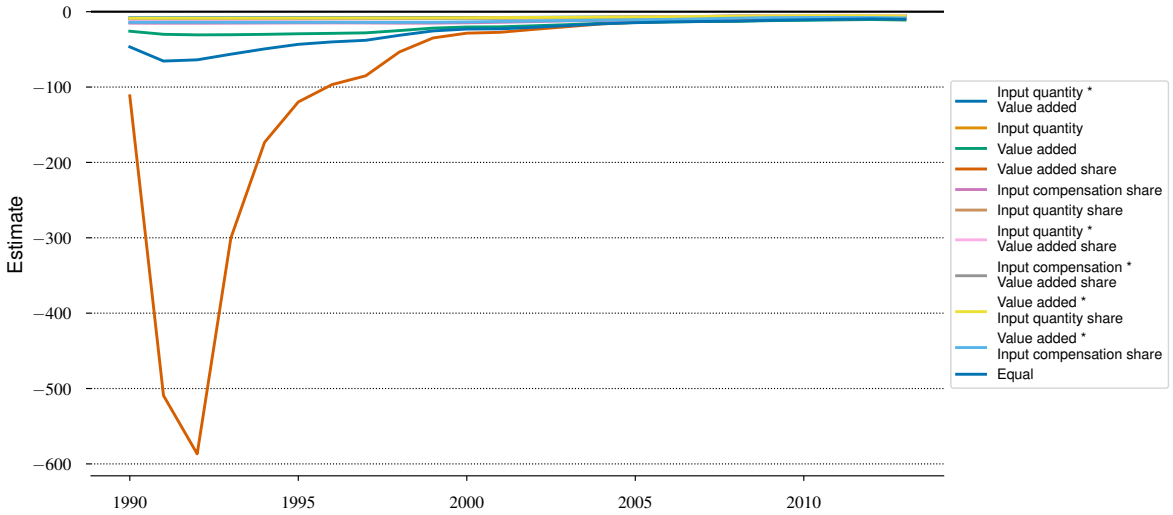

Figure 10: Labor elasticity of substitution estimates with different estimation windows (scaled)