Informality, Productivity and Growth in Mexico.

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The problem has two parts:

- One: per capita GDP growth: 2.1% average after 1994-95 crisis); 0.4% over last five years. In parallel, slow growth of labor productivity: 1.3% over the period 1988-2004. This despite many reforms in the 1990s (Nafta, privatization, deregulation, pensions, fiscal equilibrium, floating exchange rate, and so on).

- Two: slower growth in formal vs. informal employment; the resulting slow growth in the coverage of social security leads to substantial political pressures to extend social benefits to informal workers.

Suggested explanations:

- High cost and uncertain energy supply (public monopolies);
- Low lending by banks to firms (private oligopoly in banking/undefined property rights);
- High cost telecoms (private quasi-monopoly);
- Rigidities in the labor market (strong role of unions);
- Poorly educated work-force (dominant public sector union);
- Low tax base and underinvestment in public goods like infrastructure (little trust in government, low accountability).

Mexico's growth problem is over-determined:

1) There is a credible commitment to macro stability and openness ("free trade and sound money") but strong private and public sector groups extract rents at the cost of inefficiencies in key inputs for growth. Behind the difficulties in carrying out reforms is a resilient rent-sharing political equilibrium that has adapted to the transition to democracy.

2) A mix of oil rents and lower public investment generate fiscal revenues to increase workers' welfare through social programs that generate new inefficiencies and reduce the rate of growth.

In this context: (a) social programs foster informality; (b) informality lowers growth.

- A large tax on formal salaried employment and a subsidy to informal salaried and non-salaried employment.

- Returns to capital favor investments by many small informal firms. Given a volume of savings the ICOR increases.

Differences in the marginal productivity of capital and labor across firms cause output losses. Over-employment and over-investment in small informal firms that under-exploit advantages of size, invest little in technology adoption and worker training.

Why? Mexico provides social benefits to workers of similar characteristics based on labor status:

- Non-salaried and illegal salaried workers receive social protection (at times labeled social assistance).
- Legal salaried workers receive social security.

The extent, nature and source of financing of benefits differ. This segments the labor market and changes firms' behavior in socially undesirable ways.

I focus here on the economic implications of informality, although its social implications are equally problematic.

Distribution of workers (2006):

	EAP	Share in group	Share in EAP
F: Formal	**17,038,612**	**100.0**	**38.3**
ISSSTE and others	2,958,245	17.4	6.7
F1: IMSS high wage	5,986,441	35.1	13.5
F2: IMSS low wage	7,457,138	43.8	16.8
F3: IMSS Progresa	636,788	3.7	1.4
I: Informal	**25,807,529**	**100.0**	**58.1**
Illegal Salaried	8,122,517	31.5	18.3
I1: High wage	2,940,351	11.4	6.6
I2: Low wage	455,859	1.8	1.0
I3: Progresa	4,726,307	18.3	10.6
Self-employed and comisionistas	17,685,012	68.5	39.8
I4: High wage	5,818,369	22.5	13.1
I5: Low wage	7,175,133	27.8	16.1
I6: Progresa	4,691,510	18.2	10.6
U: Open unemployment	**1,600,891**	**100.0**	**3.6**
Total	**44,447,032**	**n.a.**	**100.0**
Total – ISSSTE	**41,488,787**	**100.0**	**93.3**

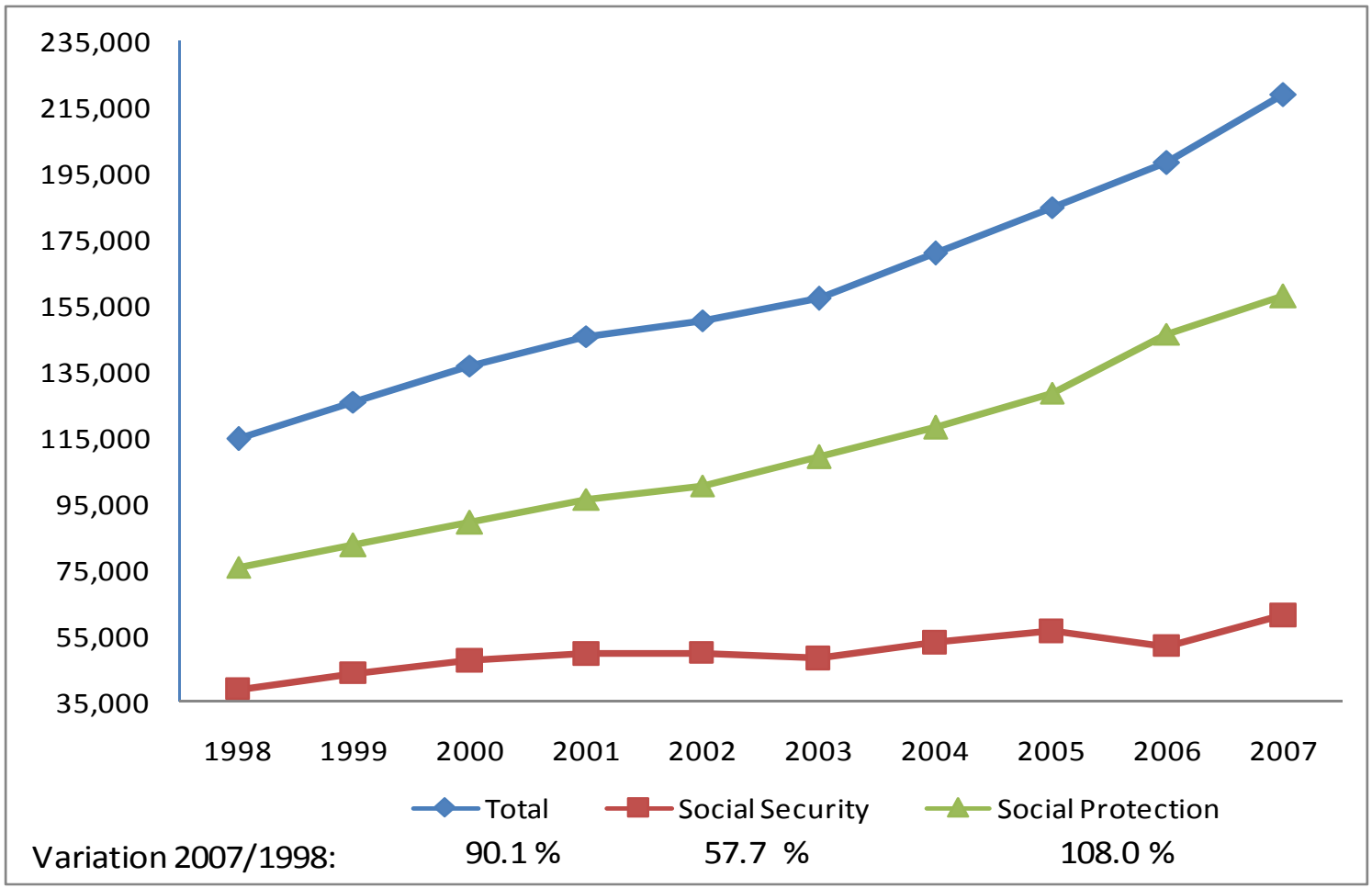
Size distribution of firms in Mexico:

INEGI vs. IMSS Workers and Firms Registries, 2003

Size (number of workers)		INEGI (1)		IMSS (2)		Difference (1) - (2)	
om	to	number of firms	workers	number of firms	workers	number of firms	workers
0	2	2,118,138	3,011,902	350,459	488,727	1,767,679	2,523,175
3	5	581,262	2,078,023	183,432	686,515	397,830	1,391,508
6	10	153,891	1,135,021	95,886	725,253	58,005	409,768
11	15	47,601	604,387	38,855	494,430	8,746	109,957
16	20	24,361	433,741	21,342	379,795	3,019	53,946
21	30	25,171	627,011	22,399	556,830	2,772	70,181
31	50	20,927	812,729	19,125	743,225	1,802	69,504
51	100	16,100	1,135,608	15,337	1,077,909	763	57,699
01	250	10,898	1,683,740	10,526	1,629,298	372	54,442
51	500	4,029	1,379,532	3,804	1,314,357	225	65,175
01	more	2,636	3,199,628	2,626	3,082,169	10	117,459
Total		3,005,014	16,101,322	763,791	11,178,508	2,241,223	4,922,814

Note: 1. These numbers exclude ambulatory firms and the self-employed.
2. Almost two thirds of all firms in Mexico are informal, i.e., illegal.
3.Evasion concentrates in small firms but medium-size firms evade too.

Resources (1998-2007):



Federal subsidies for social protection programs have grown 108% and for social security 57%. There are more resources to subsidize informal employment than formal employment.

Social security for formal workers

1. Benefits are bundled [$\oplus$]. Its costs are:

T_f = [health insurance $\oplus$ retirement pensions $\oplus$ disability pensions $\oplus$ life insurance $\oplus$ work-risk pensions $\oplus$ day care centers $\oplus$ housing loans….]

2. Workers value benefits at less than costs. Valuations depend on workers' preferences, access and quality of services, and so on. Let $\beta_f \in [0,1]$ denote the value to the worker of social security benefits. The utility of a formal job is: $U_f = w_f + \beta_f T_f$

3. Benefits are paid out of wage-based contributions by firms and workers.

Social protection for informal workers

1. Benefits are unbundled [+]. Its costs are:

   T_i = [health insurance + retirement pensions + housing loans + day care centers + …].

2. Workers may also value benefits at less than their costs, so that $\beta_i \in [0,1]$. Hence, the utility of an informal job is: $U_i = w_i + \beta_i T_i$

3. Benefits are paid from general revenues and are conditional on being informal.

Labor market:

- There is large scale mobility of workers between the formal and the informal sector.

- In any one year, more than 10% of formal workers transit to informality, and more than 10% of informal workers transit to formality.

- In the 1997-2006 period, low wage workers were in the formal sector 49% of their time; high wage 77%.

With formal-informal mobility:

Ignoring preferences for work based on hierarchy, flexibility and innate abilities, the labor market is best described by:

$$w_i + \beta_i T_i = w_f + \beta_f T_f$$

But from the point of view of firms the situation is different:
Those hiring salaried labor pay for social security; the rest do not.

So (cost of formal labor) / (cost of informal labor)…..

$$\delta = (w_f + T_f)/(w_f + \beta_f T_f - \beta_i T_i)$$

This ratio exceeds one; it is probably around 1.5.
Note that it increases with resources channeled to social protection programs.

How important are social programs?

T_f = [social security + firing and severance pay + labor taxes]

T_f = [30% + 3.5% + 2%]

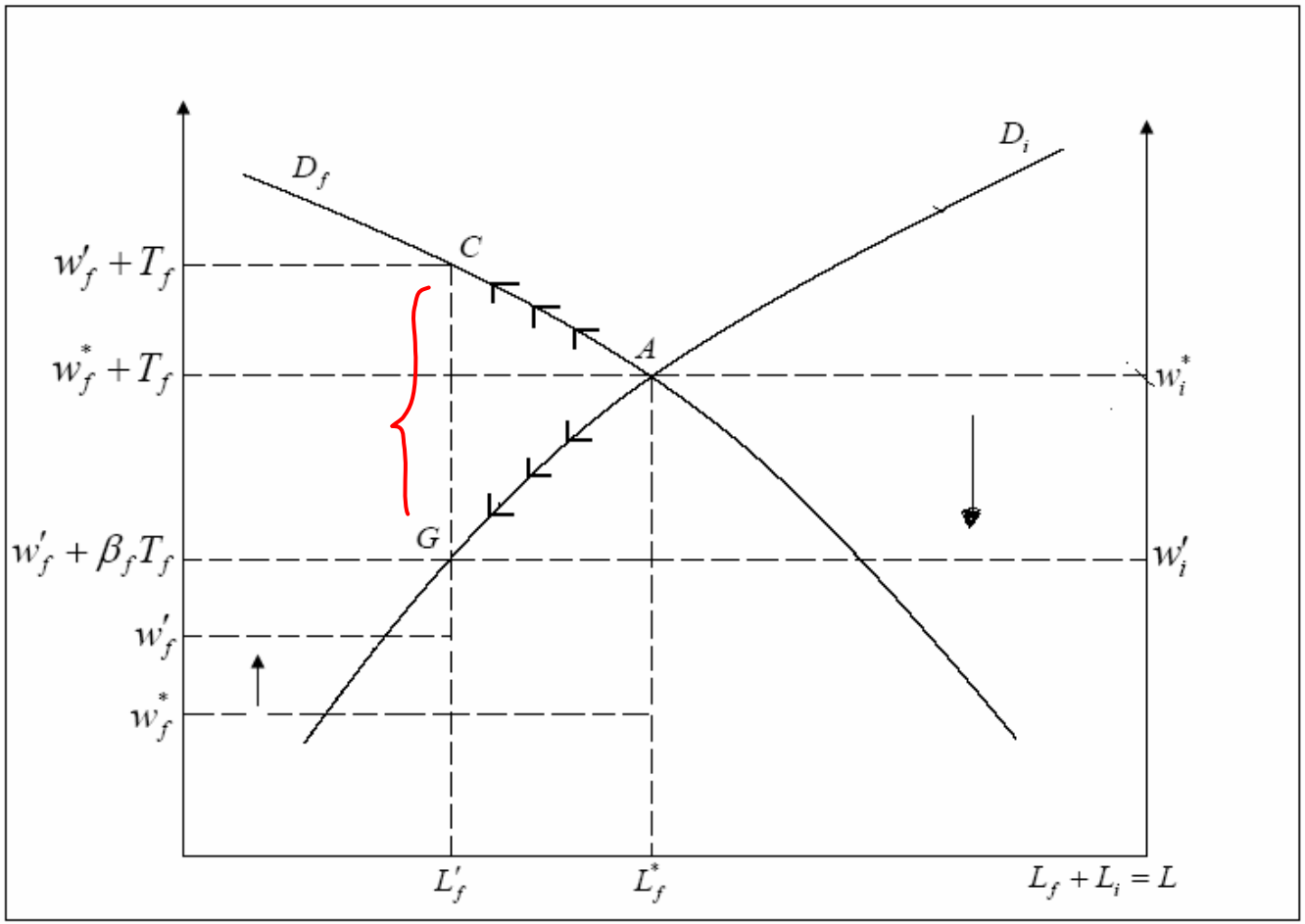
(law) (Heckman and Pages (2004)) (law)

The largest component derives from social programs.

Minimum structure of the problem:

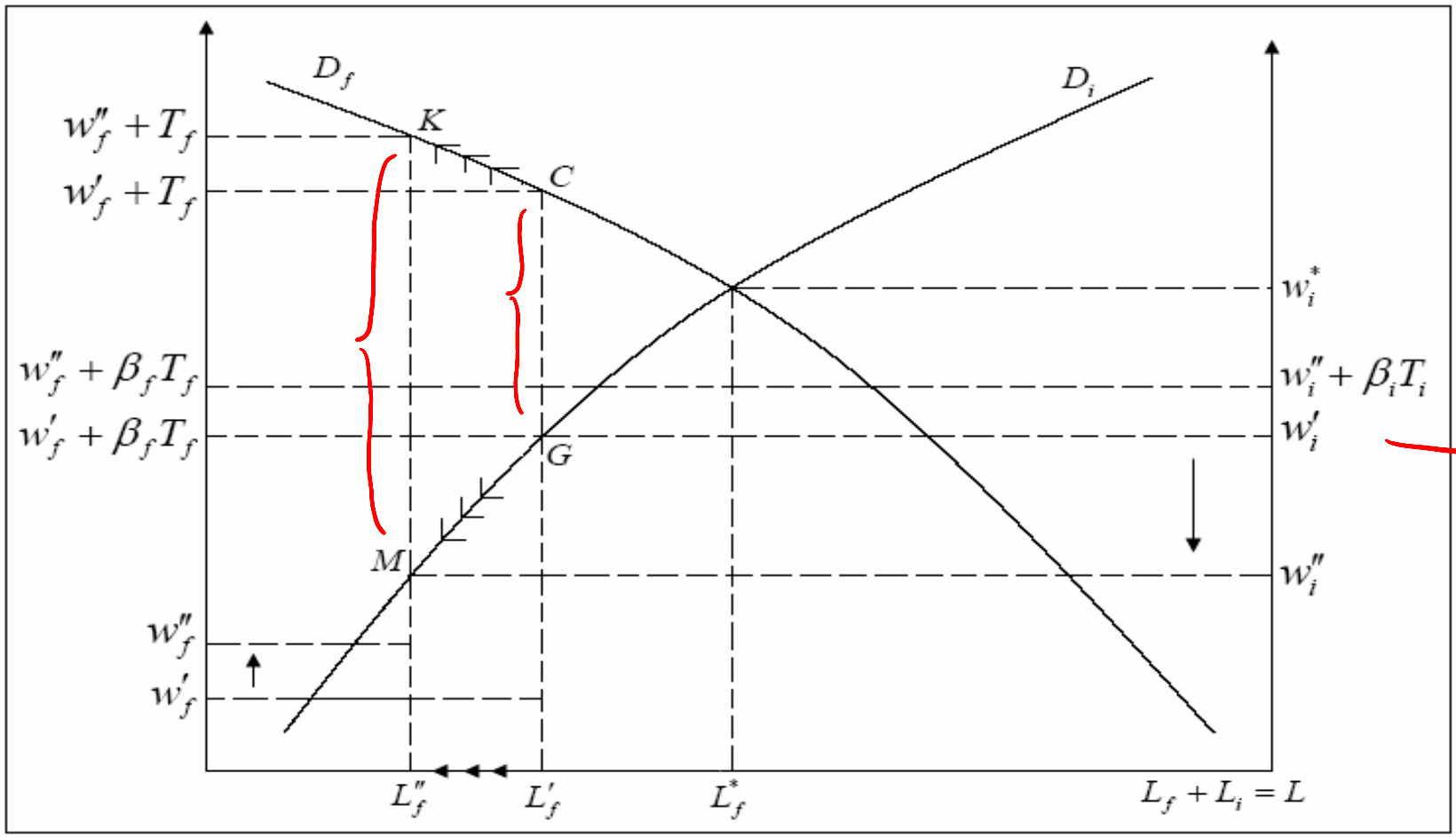
$p^w \partial Q_f / \partial L_f - [w_f + (1-\theta_f)T_f] = 0$	**Formal firms maximize profits and pay for social security (net of government subsidies).**
$p^w \partial Q_i / \partial L_i - w_i = 0$	**Informal firms and those self-employed maximize profits but do not pay for social protection.**
$w_f + \beta_f T_f = w_i + \beta_i T_i$	**Workers search for jobs to maximize utility.**
$L_f + L_i = L$	**All workers are employed.**
$G + \Delta K_p + \theta_f T_f L_f + T_i L_i = R_\pi + R_c + OX$ --- social spending	**The government's budget is balanced, but the composition of social spending matters for productivity and the use of oil revenues matters for growth.**

Social security with labor mobility (β_f <1, T_i=0)



Undervalued social security taxes formal employment. Average labor productivity falls. Workers have equal utility but productivities between salaried and non-salaried labor are unequal.

Social security with social protection ($\beta_f < 1$, $T_i > 0$)



Social protection programs further reduce labor productivity and formal employment. But **all workers are better off even though productivity falls!!!**

Evasion of social security by firms and workers

- There is a “rent” to share between workers and firms:

$$W = (1 - \beta_f) T_f$$

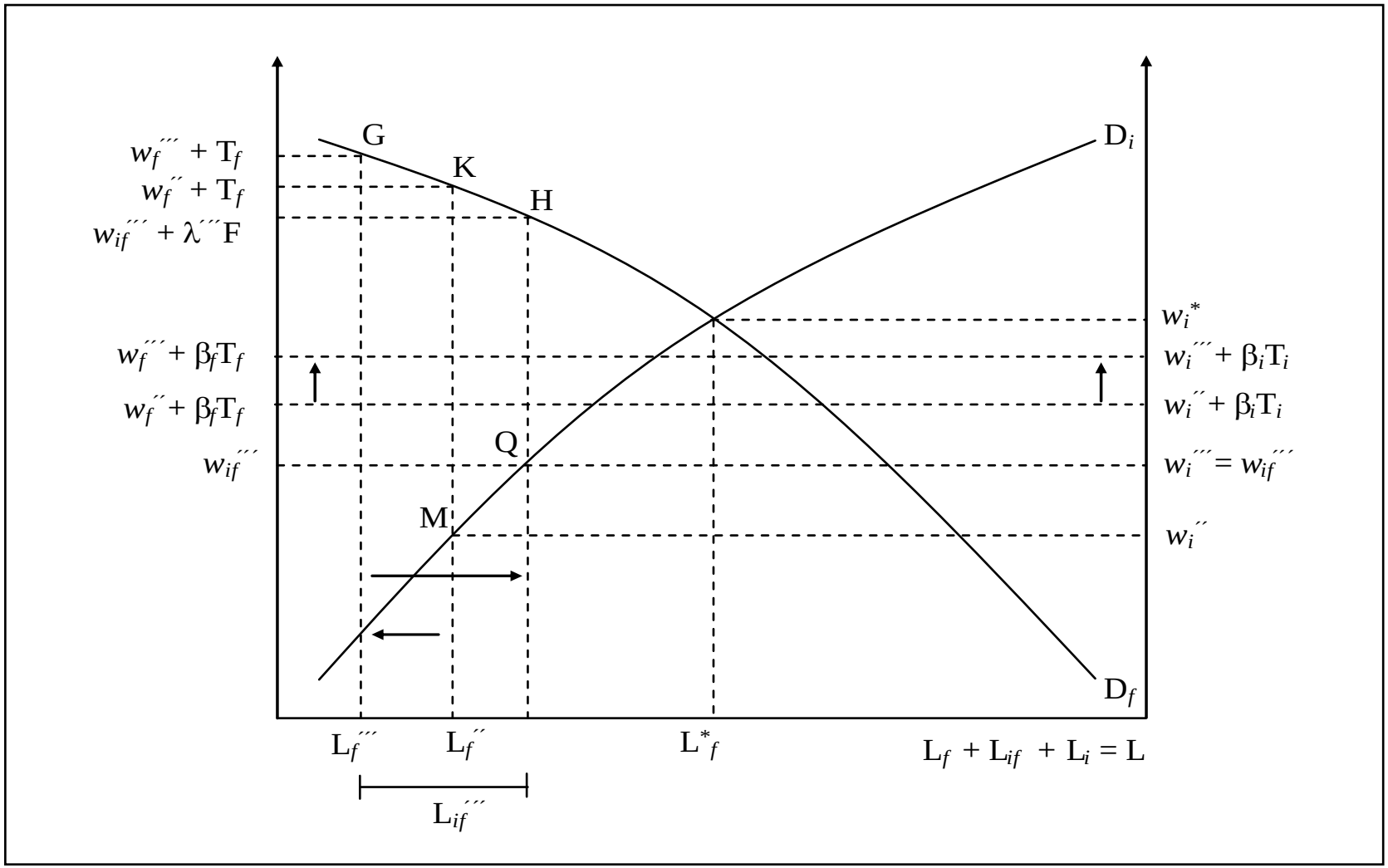
- There are fines of $F > T_f$ for evading.

- The probability of being fined is $\lambda \in [0,1]$ which is an increasing function of the level of evasion.

- Evasion creates salaried workers without social security receiving a wage $w_{if} < (w_f + T_f)$ that results from an equilibrium distribution of the rent between firms and workers.

Firms and workers both benefit from evasion.

Evasion of social security:



There are 8 million workers in L_{if} ! ; 14 million in L_f ; and 17 in L_i.

Informal employment consists of legal, L_i, and illegal, L_{if}, workers.

Messages from the general equilibrium framework:

- Observed wage rates are strongly affected by social programs. The formal wage wf results from the evasion behavior of firms and workers; as is the wage for informal salaried workers and for non-salaried workers.
- Observed labor allocations between formal and informal labor are also strongly affected by social programs.

Wage rates and labor allocations are far from the efficient levels

Informal salaried (illegal) labor, 36% of total salaried labor, is key for productivity. The Law is interpreted jointly with "society's tolerance for illegality".

In an uncertain context firm's think that:

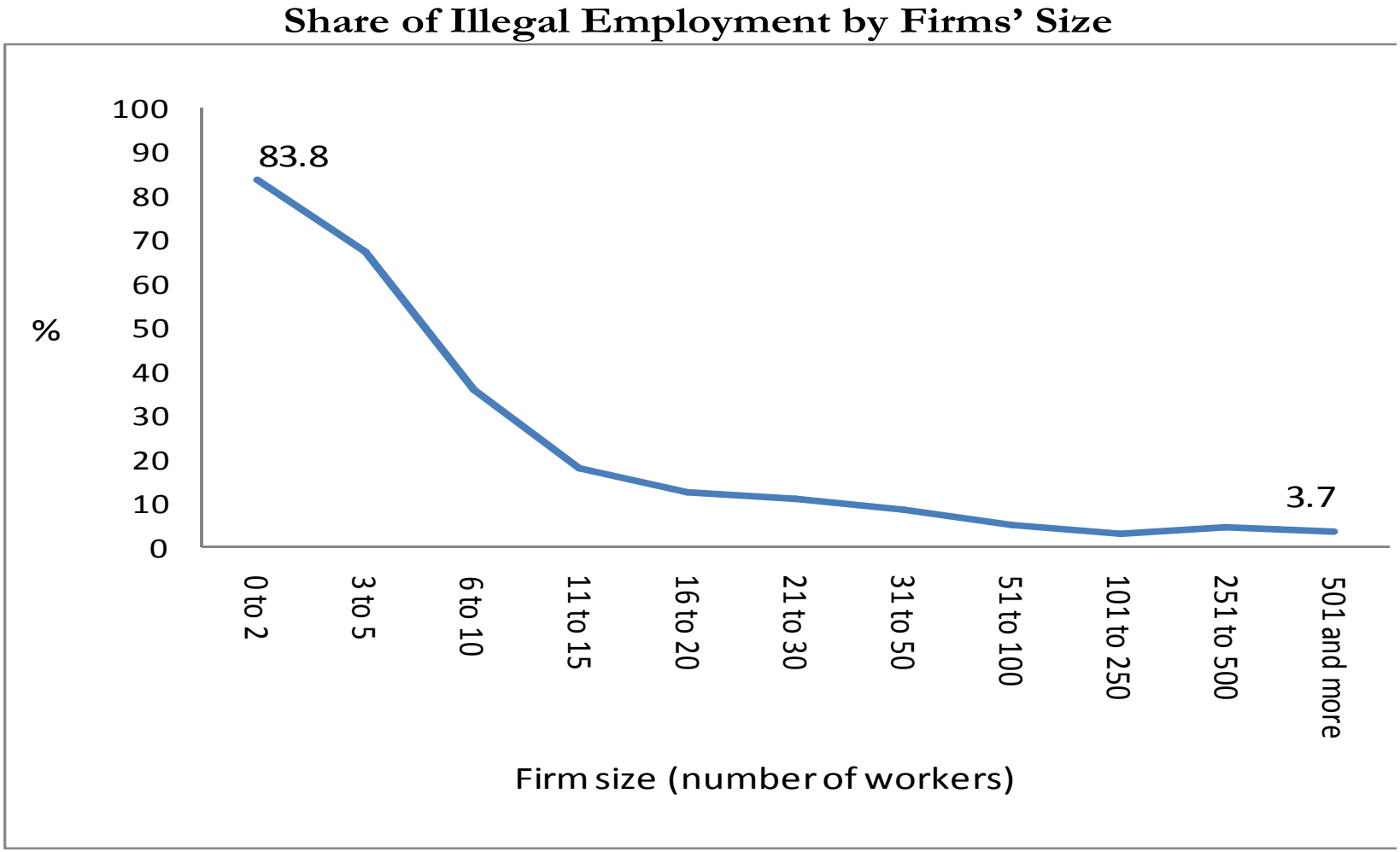
$$\lambda(L_{if}, L_f) = \begin{cases} 0 & \text{if } (L_{if} + L_f) < \underline{L} \\ \lambda_1(L_{if}, L_f) + \lambda_2(L_{if}, L_f) & \text{for } (L_{if} + L_f) \in [\underline{L}, \bar{L}] \\ 1 & \text{if } (L_{if} + L_f) > \bar{L} \end{cases}$$

•It is not the same to be a firm of 3-7 workers than a firm with 100+ workers.

•It is not the same if a firm with 75 workers has 15 legal and 60 illegal, than if the same firm has 60 legal and 15 illegal.

•Size and composition of the workforce matter.

Compliance with the Law by firms' size, 2003:



Comparing firms and workers in the Economic Census with firms and workers in the Social Security registries one finds massive evasion by small firms (0 -10 workers), important evasion by medium size firms (11-50), and almost no evasion by large firms.

Firm's profit maximization problem:

$$\text{Max } \Pi(L_f, L_{if}) = p^w Q[K_f, (L_f + L_{if})] - (w_f + T_f)L_f - [w_{if} + \lambda(L_f, L_{if})F]L_{if}$$

I assume legal and legal workers are perfect substitutes, so the first order conditions are:

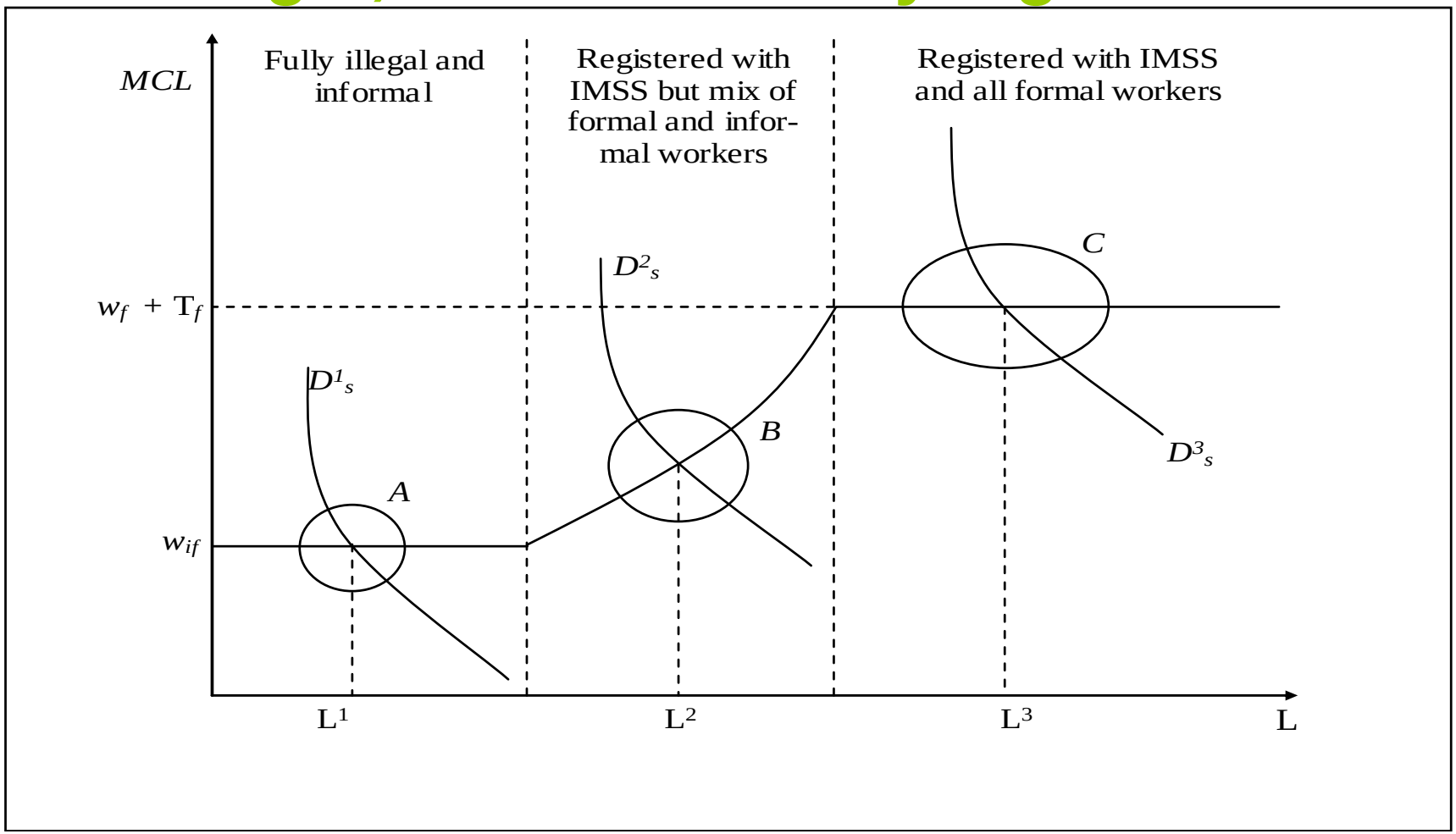
$$L_f^D \rightarrow \quad p^w \partial Q / \partial Q L_f \geq [(w_f + T_f) + (\partial\lambda_1 / \partial L_f + \partial\lambda_2 / \partial L_f).F.L_{if}]$$

$$L_{if}^D \rightarrow \quad p^w \partial Q / \partial Q L_{if} \geq [w_{if} + \lambda(L_f, L_{if})F + (\partial\lambda_1 / \partial L_{if} + \partial\lambda_2 / \partial L_{if}).F.L_{if}]$$

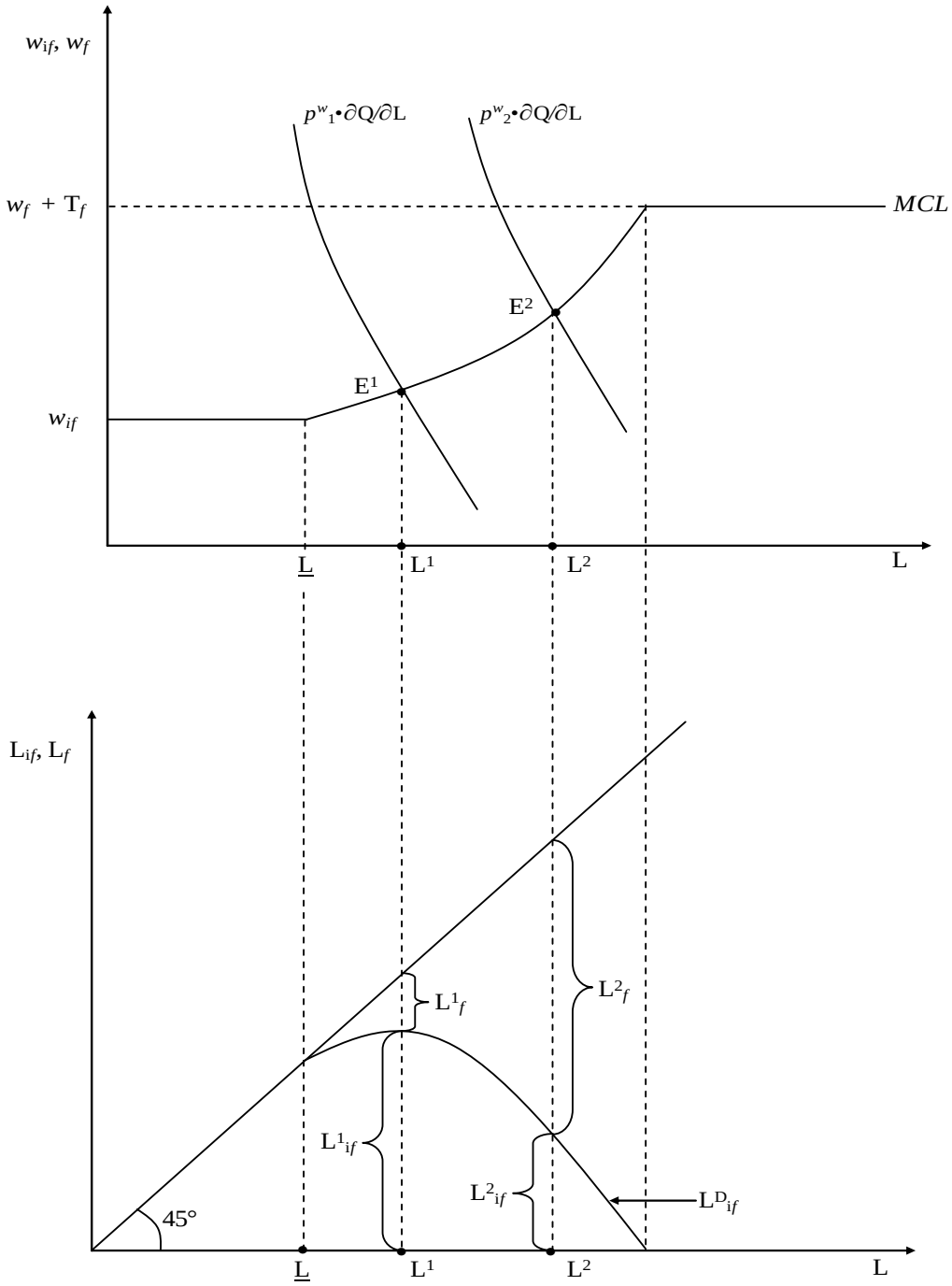
Depending on parameter values, firms hire only illegal workers, a mix of legal and illegal workers, or only legal workers.

The formality or informality of firms is endogenous to the incentive structure given by social programs.

Firms: illegal, mixed and fully legal.



The relevant segment of the MCL for firms depends in indivisibilities of capital. Informality can exist in some sector but not in others. Note that w_{if}, w_f and T_f all depend on social programs. Firms equate the expected MCL to them to the MPL. $U^i = U^j$ is consistent with $MPL^i <> MPL^j$. With labor mobility worker's utilities are equalized, not productivities.



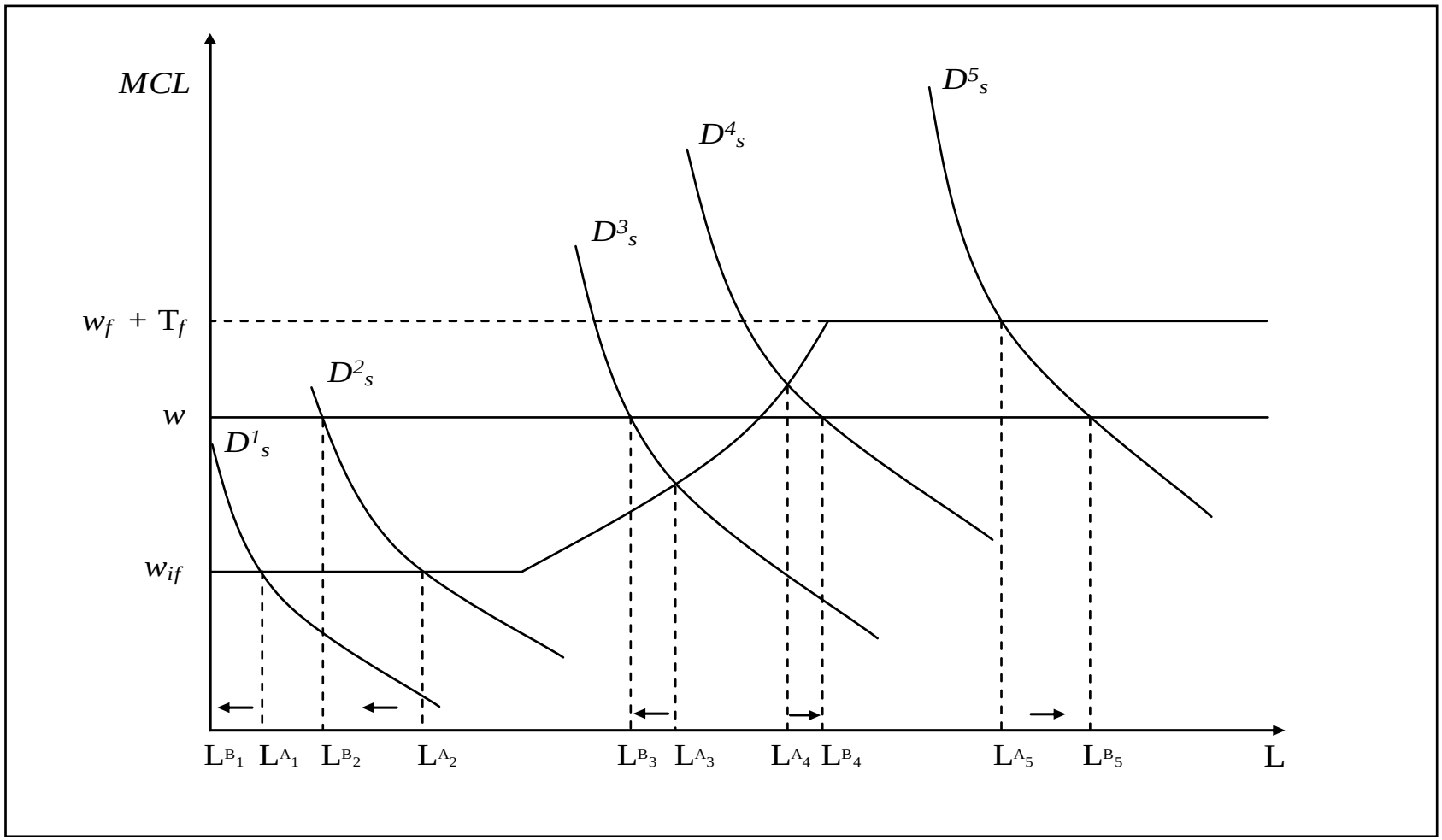
The formal-informal status of firms matters greatly for productivity and responses to shocks.

Labor productivity ranges from w_{if} to $(w_f + T_f)$; in Mexico this is about 45%.

The productivity of labor is lower in smaller firms because the cost of labor to them is less. Workers with similar abilities have different productivities.

The demand for formal labor adjusts more than proportionately to output shocks.

Informality and output composition:



Informality tilts the composition of aggregate output in favor of activities where technology allows to take advantage of lower labor costs. If all firms faced the same labor costs output of larger firms would expand and some small firms would close down.

Distribution of Firms by Size and Activity, 2003

(number of firms)

ber rs) o	Fishing	Mining	Manu-facture	Water & electricity	Cons-truction	Com-merce	Trans-portation	Services	Total
2	14,050	1,014	190,692	417	1,435	1,204,644	23,009	682,877	2,118,138
5	2,077	643	83,530	674	1,625	271,223	7,229	214,261	581,262
0	1,348	446	24,456	536	2,027	57,998	4,083	62,997	153,891
5	818	247	7,405	189	1,660	16,798	1,839	18,645	47,601
0	588	139	3,995	99	1,169	8,231	1,057	9,083	24,361
0	784	166	4,205	129	1,575	8,002	1,313	8,997	25,171
0	748	146	4,124	114	1,399	5,969	1,317	7,110	20,927
0	524	112	3,814	103	1,262	4,007	1,099	5,179	16,100
50	272	77	3,357	67	854	2,682	611	2,978	10,898
0	40	26	1,620	29	276	862	192	984	4,029
re	3	26	1,424	80	162	171	150	620	2,636
	21,252	3,042	328,622	2,437	13,444	1,580,587	41,899	1,013,731	3,005,014

1. 90% of all firms in Mexico have less than 5 workers; 95% less than 10.
2. 86% of all firms are in commerce and services; 79% have 5 workers or less.
3. Manufacturing firms are 11% of all firms; 83% have 5 workers or less

There are more smaller firms than optimal because the rates of return on these firms are artificially subsidized by social programs. Small firms cluster in activities where economies of scale and indivisibilities allow it.

The legal status of firms affects investments.

Social Programs and Rates of Return on Investment Options

Social program/ Investment Option	T_f	β_f	T_i	β_i
A: expand and stay informal	+	-	+	+
B: create new informal firm	+	-	+	+
C: register and mix workers	-	+	-	-
D: become fully legal	-	+	-	-
E: expand fully legal	-	+	-	-
F: create new fully legal firm	-	+	-	-

Social Programs and the Ranking of Rates of Return

Social programs	Rankings of rates of return privately unprofitable ← r* → privately profitable
Case 1: $[[\beta_f = 1, T_i = 0]$	r^1_1, r^1_2,---------- , r*,----------, r^1_N
Case 2: $[[\beta_f < 1, T_i > 0]$	formal r^2_1, r^2_2,---------- , r*,----------, r^2_N informal

Informality and growth, at least three effects:

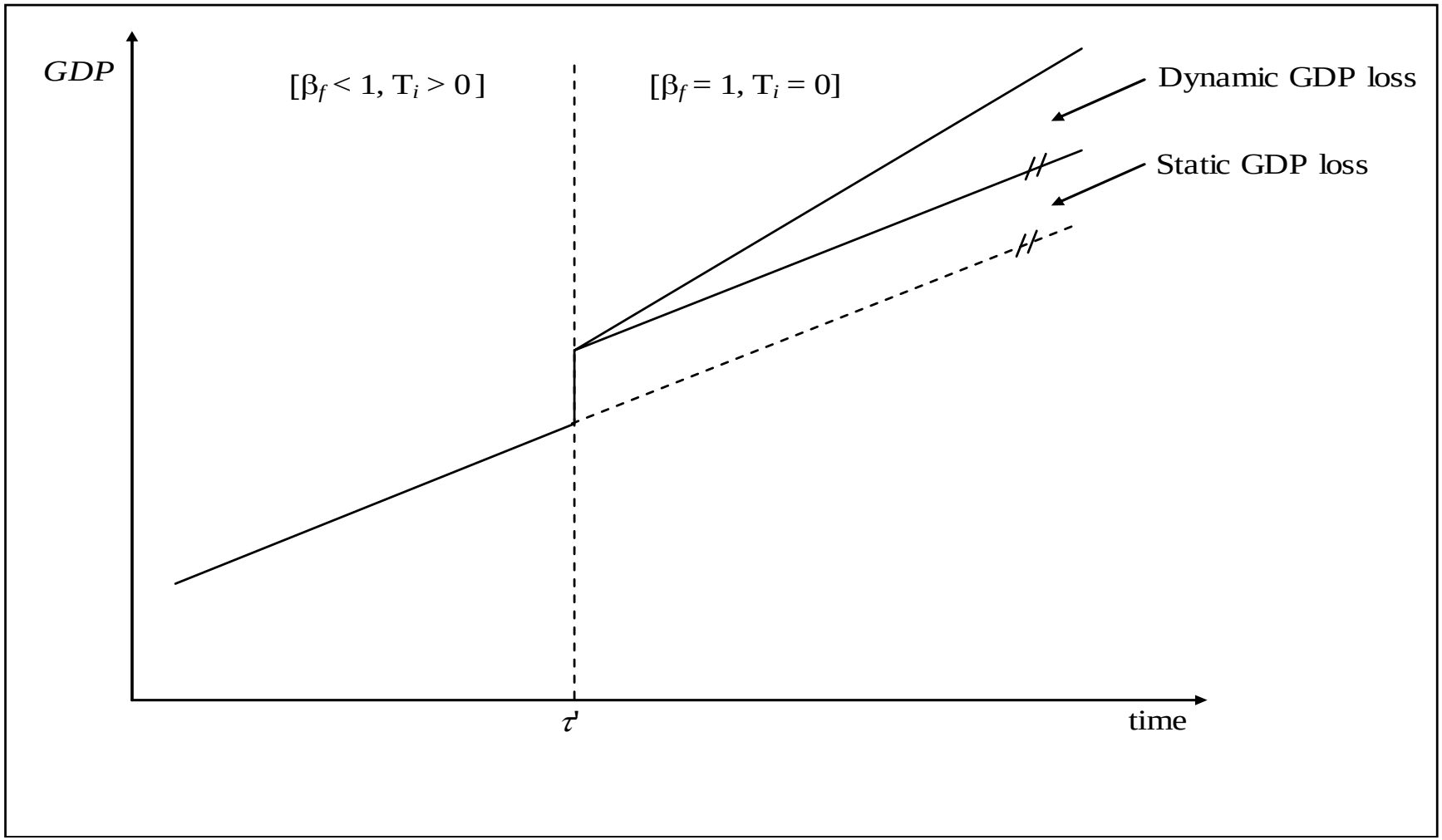
1) For a given volume of savings the ICOR is higher as investment is tilted towards informal firms and low productivity jobs.

2) Only L_f workers are forced to save (14 million) for retirement, and (L_{if} + L_i = 28 million) are not. Effects here depend on the substitution between forced and voluntary savings (and the impact on savings of non-contributory pensions).

3) There is less public investment.

Under informality Mexico is probably saving less and investing in less efficient projects. Informality acts like a drag on output and productivity growth.

Informality generates static and dynamic productivity losses:



Concluding remarks:

- Social programs have effects on firms and workers.

- Mexico imposes a large tax on labor in the formal sector and uses fiscal resources to subsidize informal employment and investments in small informal and mostly illegal firms and pays for this with a mix of oil rents and reduced public investment.

- Informality contributes to Mexico's low growth/low productivity situation. Reforming this is complex as it is associated with the link between social programs, political legitimacy and the government's ability to tax.

THANK YOU